

TACTICAL LOGISTICS SUPPORT FOR THE 2ND ARMORED CAVALRY REGIMENT

**A Monograph
by
Major John M. Friedson
Quartermaster Corps**



**School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas**

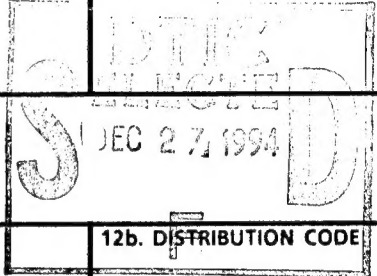
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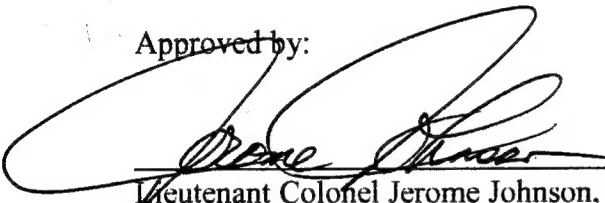
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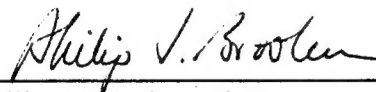
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Approved by:


_____, Monograph Director
Lieutenant Colonel Jerome Johnson, M.B.A.


_____, Deputy Director, School
Robert H. Berlin, Ph.D. of Advanced Military
Studies


_____, Director, Graduate Degree
Philip J. Brookes, Ph.D. Programs

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ABSTRACT

TACTICAL LOGISTICS SUPPORT FOR THE 2ND ARMORED CAVALRY REGIMENT by Major John M. Friedson, USA, 70 pages.

The 3d Armored Cavalry Regiment (ACR) deployed to Saudi Arabia in September 1990. During the course of Operations Desert Shield and Desert Storm its logisticians developed non-doctrinal combat service support (CSS) tactics, techniques, and procedures appropriate to the limited infrastructure of a force-projection operation. This study evaluates the suitability of those exceptional procedures for standard use by the newly-formed light ACR, the 2d ACR at Fort Polk, Louisiana.

This study first contrasts organization for combat, command and control and movement techniques used by Support Squadron 3ACR in Saudi Arabia and Iraq with those planned and practiced for support of III Corps in a European scenario. It examines why those changes were made in order to accomplish the CSS functions of manning, arming, fueling, fixing, moving, and sustaining soldiers and their equipment.

It next reviews the mission, composition, and XVIII Airborne Corps plans for employment of the 2ACR. The 3ACR's logistical organization for combat, command and control, and movement techniques are evaluated for feasibility and suitability in 2ACR operations.

The study concludes by evaluating the feasibility and suitability of 3ACR logistical organization and techniques in ODS/S for 2ACR standard use, and makes recommendations for 2ACR organization and training. The use of multifunctional logistical company teams is supported, with adjustments for 2ACR composition and mission noted.

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I. INTRODUCTION

....As the potential for regional threats increases, contingency force operations across the range of military operations become the first response. As a result, a relatively light force, rapidly deployable by air, with organic CSS, is essential to meet these contingency requirements. This contingency force requires a light, rapidly deployable force for reconnaissance/security. Thus [sic] was the need for a light armored cavalry regiment.¹

The summer of 1992 witnessed the activation of a new Army formation, the Light Armored Cavalry Regiment. The military community had long debated the creation of such an organization and the experiences of Operation Desert Shield established it as an absolute necessity. The light forces projected in August 1990 to the shores of Saudi Arabia established a thin, vulnerable 'line-in-the-sand.' They represented American resolve only by placing the lives of American servicemen in excessive danger. A dangerous gap between force deployability and force creditability was all too apparent.²

Heavier units deployed as quickly as possible by ship to add credit to the force. Preceded by the 24th Infantry Division (Mechanized), the 3d Armored Cavalry Regiment (3ACR) deployed to Saudi Arabia in September 1990. During the course of Operations Desert Shield and Desert Storm, 3ACR logisticians developed non-doctrinal combat service support (CSS) tactics, techniques, and procedures appropriate to the limited infrastructure of a force-projection operation. This study evaluates the suitability of those exceptional procedures for standard use by the newly-formed Light Armored Cavalry Regiment, the 2d Armored Cavalry Regiment (2ACR) at Fort Polk, Louisiana.

The 2ACR is being fielded to bridge the gap between force deployability and force creditability. It provides a "combat maneuver force of combined arms and services to perform reconnaissance, and [to] conduct security operations as an economy of force."³ A unit of exceptional flexibility is expected, one that can "deploy by strategic airlift as a regiment or task organized squadron packages."⁴ The advent of light cavalry presents a uniquely challenging environment: a new formation in a force projection Army, with emphasis on deployability, requiring sustainment in a variety of configurations. For the logistician, the prospect of rapidly deploying even a light armored force in force projection scenarios raises a host of concerns covering the spectrum of CSS functions.

Force-deployment operations, immature theaters and extended lines of communication (LOCs) were as unusual for the heavy 3ACR in 1990 as they may be common for the light 2ACR being fielded to support the XVIII Airborne Corps today. Normally a III Corps unit, 3ACR participated in Operation Desert Shield/Storm (ODS/S) from August 1990 until April of 1991 under XVIII Airborne Corps control. Until that deployment the expected 3ACR mission had been to deploy to Europe as part of a heavy corps in a mature theater.⁵

Operations in Southwestern Asia were significantly different from the regiment's primary return of forces to Germany (REFORGER) mission. They required numerous changes and innovations in tactical logistics procedures. Other than aviation and some support squadron assets, the regiment had expected to fall in on equipment prepositioned for overseas movement, configured to unit sets (POMCUS). It

would deploy via assembly areas and through a supporting communications zone to battle positions tied in tactically and logistically to higher, lower, and adjacent units. In the event of general war, the cavalry would be fighting over well-known terrain in heavily rehearsed operations. It expected full CSS support from established corps support command (COSCOM), echelons above corps, and host nation support structures.

When the regiment actually did go to war in Southwest Asia conditions were very different from those expected in Europe. While light fighters from the 82nd Airborne Division occupied tenuous defensive positions and the Army's deployable heavy force, the 24th Infantry Division (Mechanized), unloaded at the docks of Dhahran, the 3ACR found itself deploying to an immature theater as part of a light corps. Troopers scrambled for bulk water hauling assets, uploaded main gun ammunition to tanks already on flatcars, and negotiated with the Army Air Force Exchange System for sundry packs. These events brought home the meaning of CSS in a force projection scenario to a generation of cavalry logisticians.

Disembarking CONUS-based equipment at the port of Al Jubayl, the regiment pushed a tactical CSS structure eighty miles up the infamous Tapline Road. Its initial positions were in the vicinity of An Nu'ayriyah, Saudi Arabia. While three ground squadrons, the air cavalry squadron and the regiment's separate companies established their defensive positions, the regimental support squadron provided CSS from container to consumer (Fig. 1). No COSCOM, theater army area command, or similar structure was in place. The assumptions of doctrine and European rehearsal

were suddenly coming up very short indeed. Alternate methods of operations were suddenly not just good ideas, they were an absolute necessity.

Within five months, regimental troopers would be fighting offensive operations over unknown terrain at an unprecedented rate of advance. The tactical dispositions and logistical procedures developed by the support squadron by that time bore little resemblance to those practiced in a succession of REFORGER and National Training Center (NTC) rotations. It provided agile, synchronized CSS support throughout the depth of an extended battlefield.

Unlike the mission projected for the 3ACR, but much like the one it received, the 2ACR is expected to deploy and operate world-wide as part of a light corps, in immature theaters with limited or non-existent support structures, over unfamiliar terrain as part of rapid reaction, force-projection operations. In support of the contingency force, the mission of the 2ACR is to "provide reconnaissance and security; confirm/deny intelligence; direct/control deep fires; conduct counter-reconnaissance; and conduct combat operations in an economy of force role."⁶

Although it executes standard cavalry operations, the organization, mission, and tactics of the 2ACR are unique. The doctrinally standard methods of tactical logistical sustainment for heavy ACR's and divisional operations may not be appropriate for this unit. Instead, procedures derived by the 3ACR in Operations Desert Shield and Desert Storm may better support normal 2ACR operations. If so, there are

significant organizational, training, and command and control (C²) implications and issues to be resolved above and beyond those identified in even the latest logistical manuals.⁷

This study first contrasts organization for combat, command and control and movement techniques used by Support Squadron 3ACR in Saudi Arabia and Iraq with those planned and practiced for support of III Corps in a European scenario. It examines why 3ACR logisticians made those changes to accomplish the CSS functions of manning, arming, fueling, fixing, moving, and sustaining soldiers and their equipment. The study next reviews the mission, composition, and XVIII Airborne Corps plans for employment of the 2ACR. It evaluates 3ACR ODS/S organization for combat, C², and movement techniques for feasibility and suitability in 2ACR operations.

The study concludes by evaluating the feasibility and suitability of the Support Squadron, 3ACR organizations and techniques from ODS/S for 2ACR standard use. The analysis supports the use of multifunctional logistical company teams with adjustments for 2ACR composition and mission. Conditions particular to ODS/S, such as virtually secure supply lines, are identified and their impact evaluated. Recommendations for Support Squadron 2ACR organization and training based on those conclusions generally support the use of 3ACR ODS/S developed procedures.

II. 3D ARMORED CAVALRY REGIMENT LOGISTICS IN OPERATIONS DESERT SHIELD AND DESERT STORM

In the ACR, the RSS [regimental support squadron] commander locates the RSA [regimental support area] in the security area or in the regimental rear areas. He may also locate the RSA in a brigade rear area or in a division area based on METT-T [mission, enemy, terrain, troops, and time]. In any case, the commander locates the RSA approximately 25 kilometers behind the FLOT. This distance is beyond the range of threat cannon artillery.⁸ FM 63-1 (Draft)

SPT Operations Officer: "Sir, before we start moving again, I've just plotted some incoming rounds reported by Regimental Headquarters. They're landing several kilometers behind us."

SPT Squadron Commander: "Hmm, tell you what, let's just stay here for a while..."⁹ ODS/S

This chapter contrasts organization for combat, command and control and movement techniques used by Support Squadron 3ACR in Saudi Arabia and Iraq with those planned and practiced for support of III Corps in Europe. It examines how and why support squadron leaders made those changes. The success or failure of these changes is critiqued based on the squadron's changed ability to accomplish CSS functions.¹⁰

Doctrinal Operations

The 3ACR formally activated its support squadron from a provisional status in the fall of 1985. The support squadron created and activated units until it assumed its current modified table of equipment posture in the spring of 1986.¹¹ Between 1986 and 1989, its organization for combat was consistent with that advocated in the present version of FM 17-95, *Cavalry Operations*.

The regimental support area (RSA) reflected that combat organization. It was a combination of organic support squadron troops, regimental units such as the

personnel services company (-), 89th Chemical Company headquarters, and elements of OPCON and attached units. A military police platoon, air defense artillery maintenance, and a COSCOM heavy equipment transport (HET) platoon were common attachments during NTC train-ups and rotations. Located doctrinally about twenty-five kilometers behind the forward line of own troops (FLOT), the RSA was frequently positioned somewhat closer due to space limitations in maneuver areas. Supported squadrons frequently located their field trains in or near the RSA.

The Support Squadron 3ACR and other associated logistics elements operated in a relatively static environment. It was not unusual for the RSA to reposition only once every four or five days in home station training. Operations at the NTC were only slightly more mobile, with three or four relocation's during a fourteen day rotation being the norm.

Supply support was provided through a combination of supply point operations and logistics release points (LRPs). Supply point operations required logistics package operations (LOGPACs) under the control of supported squadron support platoon leaders to return to the RSA to pick up food, fuel, ammunition and repair parts. The support platoon leaders then delivered supplies to squadron LRPs. If distances between the RSA and the supported squadrons made timely resupply difficult, the squadrons positioned their field trains at a point between the RSA and their sectors. The support squadron often used regimental level LRP's to coordinate delivery of bulk fuel, ammunition, or barrier material forward for a specific mission.

The maintenance troop provided direct support (DS) maintenance by small contact teams which formed habitual relationships with one squadron. These teams assisted with diagnostics and swap-out of DS assemblies. Supported squadrons evacuated vehicles beyond the capability of their organic organizational maintenance, squadron maintenance officer (SMO), and the DS team from its unit maintenance collection point to the maintenance troop in the RSA. Six HETs were available in the supply and transportation troop (S&T) to recover combat vehicles too damaged to be towed. Helicopter maintenance was under the complete control of Fourth (Aviation) squadron's aviation unit maintenance troop. Even the aviation parts section of the authorized stockage listing (ASL) was placed under its control during field operations.

Medical troop provided medical support by ambulance exchange points (AXPs), with ambulances moving from one preplanned AXP site to another. Its M113 ambulances moved forward from these sites to the supported squadron's aide station, and evacuated patients back to the AXP. The wheeled ambulance platoon then evacuated those patients back to the medical troop's treatment facility. These same vehicles brought medical supplies forward to resupply AXPs and aide stations.

These methods of operation had tremendous advantages in centralizing control of CSS operations. Sufficient resources were available to provide acceptable local security, and personnel could be massed for squadron level drills such as mass casualty and decontamination operations. Repositioning of the Squadron, however, was time consuming and required considerable pre-planning. The extended RSA, with organic troops, field trains, attachments and Corps elements could easily occupy twelve to

twenty square kilometers. As a result, detailed reconnaissance, site planning, and movement tables were an absolute necessity. It was not uncommon for the squadron to virtually shut down the majority of CSS support for six to eight hours, plus movement time, for each move that the RSA made.

Local training exercises at Fort Bliss, Texas, rotations at the NTC and participation in REFORGER '88 validated the centralized RSA as a workable tactical disposition. The approach to the problems created by a single, unwieldy organization was to concentrate on methods of protection and movement, focusing on better performance of, rather than different ways to provide CSS support. As the installations provided facilities support at home station and NTC, and as the regiment fell in on an established infrastructure during REFORGER, the first two support squadron commanders did not identify a need for a radical change to operating procedures.¹²

Organization For Combat

The support squadron's third commander, LTC Daniel G. Mongeon, explored organizing the squadron into forward and main elements in a change from doctrinal procedures.¹³ Under his direction, the squadron increased on-site CSS support to less than regimental-sized field problems and gunneries and provided more logistics functions. Previously limited to DS maintenance teams, the logistics packages provided quickly grew to include fuel, medical, transport, material handling, additional maintenance and material management representation. A small staff element provided supervision to what was still not a tactical element.

LTC Mongeon directed the support squadron staff to begin planning for split-based CSS operations that he termed logistics task forces. These were to be CSS company teams, completely mobile, each with a representative slice of maintenance, medical, and supply support. As a forward support battalion was a relatively mobile projection of division support area, the logistics task force would be an extremely mobile element of the RSA.

The support squadron's logistics task force (hereafter referred to as company team) concept was first fully exercised in the spring of 1990, during a regimental field problem.¹⁴ At that time the focus was on preparation for the expected fall rotation to the NTC. CSS company teams positioned at opposite ends of the Fort Bliss maneuver area in support of the blueforce and redforce squadrons.

The use of CSS company teams during this exercise reduced supported squadron LOGPAC travel time by about sixty-five percent.¹⁵ Providing rations, bulk fuel, packaged petroleum, oil, and lubricants, barrier material and forward medical support well forward enhanced operations by reducing turn-around time while increasing mobility.

The lessons learned from this operation paid an unexpectedly high return when in August 1990 the regiment was alerted for deployment to Operation Desert Shield. The regiment's defensive positions in the vicinity of An Nu'ayriyah were initially south, then north of Tapline Road. The RSA remained located in an inactive quarry, a site relatively easy to secure, on a paved road, and near a rare open source of water. Also, it was located out of indirect fire range, given the planned main battle

area. For these reasons, it was desirable to leave it in place when the defense shifted north. Unfortunately, its positioning also presented some difficulty for the supported squadrons, as they were training at an extended distance from their support base for an indefinite amount of time, and were separated from it by Tapline Road.

To provide bulk support closer to the defended sectors, the support squadron established an RSA forward north of Tapline Road. A staff representative from the support squadron operations (S-3) section supervised a tactically configured, mobile support area (Fig. 2). Maintenance diagnostic support, a subset of line replaceable units (LRUs), food, bottled and bulk water, ambulances and the regiment's combat replacement M1A1's were now all available in sector. The supported squadrons almost eliminated LOGPAC traffic to the RSA. In addition to enhancing safety for all users of Tapline road, this arrangement enhanced manning, fueling, fixing and protection functions (Fig. 3). The support squadron's logisticians used the RSA forward as a test bed for development of internal reporting and accounting procedures. The SOPs they developed became the basis for organization and operation of logistics company teams during the offensive.

In the middle of January, 1991 the regiment moved to new positions 150 miles to the west in preparation for the offensive. The RSA had been given so many additional resources and responsibilities during its four months in the desert that its tactical capability to move as a unit was significantly impaired. In addition to several day's stockages of food, fuel, water and ammunition, it also hosted the 553d Corps Support Battalion, a unit by table of equipment (TOE) significantly less mobile than

the support squadron. With attachments already including one wheeled and two air ambulance platoons, military police, emergency ordnance disposal, Army Material Command civilians (and semi-depot maintenance for M1 engines), the RSA was also burdened by personnel replacements for the heavy combat losses expected.

Regardless of the tactical implications, reducing the size of stocks or the number of units in the RSA was not possible. The implications of limited mobility, given the depth of the offensive planned, (about half of what actually occurred), gave much pause to the regiment's logistics planners.¹⁶ They expected the forthcoming battle to require all available resources.

Echelonment of CSS assets based on their relative mobility became the guiding principle behind the RSA's reorganization for the offensive. The logistics planners derived mutually supporting CSS techniques. These techniques included the use of support squadron company logistics teams, mobile command groups, and forward projection of 553d Corps Support Battalion (CSB) elements. The RSA would devolve into an almost totally static base, all mobile assets and command elements being projected forward (Fig. 4).

Command And Control

In preparation for split-based CSS operations the support squadron expanded its portion of the RSA, and reconfigured itself to include two tangential company teams. The commander designated these teams as Task Force Alpha and Task Force Bravo (Fig. 5,6). Initially, LTC Mongeon gave command of each team to a squadron

field grade staff officer who would objectively lead the mixed element, allowing unit commanders to focus on their normal responsibilities.¹⁷ He planned to place the static RSA main under control of the material management officer. Each team command post (CP) and the RSA main had additional augmentees from the squadron staff.

In addition to C² provided by these CP's, the support squadron commander, the operations (S-3), intelligence (S-2), and administration (S-1) officers formed a mobile command group. Unfortunately, the extended distances covered by the regiment's advance soon broke down all electronic communication between the RSA main and the command group. After the second day of the advance the S-3 flew south daily to establish priorities, verify shipments, and pick up critically needed supplies. By the time the advance halted, each trip was over 170 miles one-way. Corps could not establish mobile subscriber equipment (MSE) nets quickly enough to facilitate communication to the forward areas and AM radios planned to span the gap simply did not work.¹⁸

The command group along with the squadron's quick reaction force would position daily in accordance with mission, enemy, terrain, troops and time available (METT-T) with one of company teams. Normally, the command group would position with the forward team. The 553d CSB adopted a similar method. In practice the speed of the advance meant that the teams would travel sequentially, one falling in on the site vacated by the other. This facilitated security, since positioning in areas cleared of mines was more important than avoiding targeting by enemy indirect fire. When the support squadron's teams moved farther away from the RSA main an

element of the 553d CSB first set up temporary stockages of fuel and water between the RSA main and the rearmost team. As the battle progressed, the 553d CSB element shuttled between the nearest COSCOM logistics base and another point midway to the nearest logistics team.

With the 553d CSB delivering high volume consumption items to the support squadron's logistics teams all logistics functions were fulfilled at least to some degree (Fig. 7). The manning function included medical support and casualty replacement, although most medical support was provided to injured civilians and Iraqi prisoners, and casualty replacements were not required. The support squadron's ammunition trucks provided arming, while the combined assets of both support squadron and the 553d CSB provided fuel. DS maintenance teams utilized a selection of critical repair parts to fulfill the fixing function. The support squadron's wheeled vehicles were pooled, and, with UH-60 helicopters from the aviation squadron, sustained soldiers and their equipment by providing water, rations, mortuary affairs and even mail to attacking troopers. Regimental level escort by replacement combat vehicles and crews, standardized tactical deployment of logistics teams at the halts, and a well-marked and maintained main supply route (MSR) insured protection of the supporting force. Under the circumstances command and control proved adequate if somewhat strained.

Manning, Fueling, Fixing, Arming And Protecting

Although the CSS support provided proved up to the mission requirements, non-doctrinal solutions came with additional limitations as well as additional utility.

Manning

For example, the medical troop doctrinally provides support by connecting clearing station operations in the RSA with squadron aid stations through the use of AXP's. FM 63-1 (Draft) notes that in the offense:

Initially, the medical company located as far forward as combat operations permit. This tactic allows maximum use of facilities at the initial location, thus enhancing overall effectiveness of support...Also, the medical company maintains the mobility of treatment elements. It maintains contact through evacuation elements operating between the unit-level facilities and the clearing station.¹⁹

Medical support provided by medical troop's clearing station normally provided medical, dental, and patient holding (class II level) medical support in the RSA.²⁰ Under the squadron's reorganization for combat, only battalion aid station (class I level) support would be available in the RSA main, while all additional medical assets were divided into two class I capable sections, one for each company team, and one additional package capable of bringing either of the other two up to class II level.²¹ The medical troop commander moved this additional package of personnel and equipment from company team to company team. It normally staying with the rearmost team, providing laboratory, X-ray, and other sections required for a class II support level. Medivac aircraft brought much of this material as the team moved forward, medical troop brought the balance by truck.²²

The price for providing class II and additional class I support forward was paid in the RSA main:

The elements of Medical Troop that were not assigned to one of these forward elements were designated the Clearing Station Main. A small medical cell consisting of one Physician's Assistant, two M997 wheeled ambulances and 8 medics was left at the base camp to provide medical care to American Soldiers at the base camp and to Iraqi Prisoners as they were brought back to the rear. It

was felt this small cell could safely care for this contingent due to the proximity of the base camp to Support Hospitals.²³

The additional medical evacuation assets from corps had made distributed medical support feasible with an acceptably low amount of risk. As the medical troop commander noted:

The ability to break a Medical Unit into smaller, highly mobile "cells" and to integrate these "cells" quickly back into the framework of the larger Clearing Station allowed the Third Armored Cavalry Regiment to make the best use of the air assets in direct support, and to maximize the time when a fully equipped Clearing Station was available to support the Regiment.²⁴

Fueling

Providing the estimated 170,000 gallons of commercial aviation fuel per day plus small amounts of DF-2 (diesel) and gasoline required by the regiment in pursuit had given logistics planners the most concern prior to crossing the line-of-departure.²⁵ Extensive review of time-distance tables, including light data, had predicted DS support lagging behind consumption after about the second day of operations. Six additional heavy expanded mobility tactical trucks (HEMTT) fuel tankers enabled additional support to the Regimental tactical operations center (TOC), chemical vehicles, and gasoline support as well as Jet-A for the logistics teams. However, whereas even the current draft of FM 63-3 *Corps Support Command* shows the COSCOM delivery of fuel stopping at the brigade rear, the regiment required throughput of the 170,000 gallons a day expected for this operation considerably farther forward.²⁶

The 3ACR overcame the projected deficiencies in several ways. Commanders heavily stressed fuel conservation by directing combat vehicles to shut down during tactical pauses. For example, in a stationary tank platoon, only one M1A1 might

have its engine running, and its thermal sights on. Projection of the 553d CSB's fuel assets forward, using eighteen 5,000 gallon tankers and several fuel system supply point's for temporary storage split long supply lines into local, or at least shorter, loops that reduced tanker waiting to upload or download fuel. Use of the fuel system supply points alone increased fuel throughput by at least 30%.²⁷ The combination of these actions, and drawing on additional corps logistics bases as they became available, enabled the regiment to move and fight without operational pauses due to low fuel supplies.²⁸

Fixing

Moving DS equipment and personnel forward with the company teams supported the fixing function well. Their M1/M3 test set equipment provided diagnostic capability for M1 and M3 LRU's. This capability supported the squadron maintenance officer's abilities to quickly repair combat vehicles with their allocation of LRU's from the authorized stockage listing (ASL). In addition, a full-up power-pack (FUPP) was placed with each DS team in the supported squadrons, and another with each of the support squadron's company logistics teams. These provisions along with a very limited selection of ASL and LRU's carried by the company teams enabled immediate replacement of failed components. However, the separation of these resources from the main ASL, and a lack of semi-fixed facilities meant limited capability for night operations, as well as a heavy reliance on helicopter delivery of parts from the ASL left back at the RSA main. Limited enemy action (both ground and anti-aircraft),

good weather, and sufficient availability of UH-60 helicopter support resulted in DS maintenance operations that were not challenged beyond their capability.

Protecting

The regiment protected company team assets to the maximum extent possible given frequent movement and limited organic resources. Logistics assets moved primarily along a main supply route (MSR) cleared by bulldozer and roadgrader, through areas already swept by regimental combat forces. Limits to these methods were revealed when the Headquarters and Headquarters Troop (HHT) commander's vehicle had a tire blown off by a mine next to the MSR, and by the squadron commander's personal capture of a half-dozen enemy soldiers. Nonetheless, security measures taken included the provisioning of each vehicle with wire and chemical light trip devices for perimeter construction, standardized vehicle, fighting position, and crew served weapons emplacement, and thoroughly practiced reaction drills. Operational readiness float combat vehicles provided some escort capability, although the regimental headquarters eventually drew them farther forward for its own protection. The forward-most company team could then only expect the squadron's light quick reaction force for immediate assistance .

Specific protection for logistics movement back to the CSB and RSA main areas was virtually nonexistent, and luckily proved unnecessary. The sheer length of the supply line made such a task as impossible as enemy inaction made it unnecessary.

Summary

The 3ACR's ODS/S force projection operations were significantly different from those of its expected European mission. They were also highly peculiar to extended operations in a developing theater, with significant corps support, conducting pursuit operations against an ineffectual enemy. Non-standard tactical logistics procedures were largely successful, although conducted with thin margins of safety. Increased flexibility due to reorganization into two logistics company teams, an RSA main, and a mobile command group was the basis of successful support squadron operations. The primary advantages of this organization were its enhanced abilities to echelon and project support during mobile operations over an extended distance.

III. LOGISTICS PROCEDURES FOR THE 2D ARMORED CAVALRY REGIMENT

"Employment of the entire regiment is probably the exception, rather than the rule. We think a squadron is the most likely crisis response force.... Most likely structure for contingency operations are - non-existent theater structure and immature theater structure. Therefore, the 2d ACR CSS procedures should focus on these environments.²⁹

- XVIII Airborne Corps G-3 Staff Planner

The study now reviews the mission, composition, and XVIII Airborne Corps plans for employment of the 2ACR. It evaluates the 3ACR's ODS/S organization for combat, C², and movement techniques for feasibility and suitability in 2ACR operations. Emphasis is on configuration and employment of multi-functional troop teams, mobility considerations (a fixed base, a mobile command group, and troop teams), and movement.

The 2ACR Mission - Implication For Logistics

The "Executive Summary" of the 2ACR's latest table of organization and equipment (TOE), #174600L defines the regiment's mission statement:

[It] provides combat maneuver force of combined arms and services to perform reconnaissance, and conduct security operations as an economy of force. Deploy by strategic airlift as a regiment or task organized squadron packages.³⁰

The summary continues by noting that the 2ACR may expect employment in both low and mid-intensity conflict, with select application in high intensity environments. Significantly, it envisions echeloning of forces into theater at both regimental and squadron level.

"The light cavalry squadron will rapidly deploy as part of a light cavalry regiment. The squadron will tailor combat power and package its support to ensure the initially deployed force is optimally organized to accomplish its mission."³¹

The support squadron's requirements to provide logistics support mirror the regiment's ability to deploy and operate task-organized combat elements:

"The regimental support squadron will augment organic assets to meet the full routine combat requirements as well as peak needs. [of the line squadrons]... When air and ground cavalry units are cross attached, CSS will accompany the unit that is cross attached."³²

Field Manual 63-1 (Draft) notes that the support squadron "is capable of detaching a single squadron support slice without degrading support to the regiment."³³ To accomplish this mission the manual observes: "each troop is capable of being divided into modules to meet multiple requirements of its customer's units. Modules are duplicated to allow units to be tailored, augmented, or reinforced where the need is most critical."³⁴ What the manual does not do, however, is illustrate typical CSS task-organization to provide echeloned or split-base operations, nor how to command, control, or maneuver such elements.

2ACR Organization And The CSS Mission

The 2ACR's specific CSS requirements will vary over time, as will the planned composition of the regiment. In its transitional form, the bulk of the organization's vehicles will be high mobility multipurpose wheeled vehicle (HMMWV)-based tube-launched, optically-acquired, wire-guided missiles (TOWs), with towed 155mm artillery and AH-58D Kiowa Warrior aircraft providing the balance of its firepower. By 1999, however, requirements for all classes of supply will increase due to fielding of the armored gun system (AGS), M113A3 armored personnel carriers, 155 Paladin artillery, Comanche and UH-60 Blackhawk variant helicopters (Fig. 8). In all forms, however, the 2ACR will require fewer resources than the heavy ACR does with its Bradley fighting vehicles and M1A1 tanks.

The mission of the support squadron will be to provide CSS support from preparation for movement through embarkation, debarkation, mission operations and then the whole process in reverse. For example, the TOE's executive summary projects the first CSS elements from medical, maintenance, and supply and transportation troops arriving on lift two of day D+1 even in a forced entry scenario.³⁵ The composition of CSS assets matches, at least to some extent, the need to echelon combat power into the theater of operations. FM 63-1 (Draft) notes that:

The support squadron consists of four troops: headquarters, supply and transportation, maintenance, and medical. Each has a specific role in providing designated logistics and health service support (HSS) assets in the squadron. Each troop is capable of being divided into modules to meet multiple requirements of its customer's units. Modules are duplicated to allow units to be tailored, augmented, or reinforced where the need is most critical.³⁶

A review of the squadron's organization somewhat belies the field manual's claim of modularity.

To begin with, the ability to echelon support, along with combat power into an area of operations is limited by both the material assets to provide such support, and a command and control structure to direct it. Neither FM 63-1 (Draft), nor the TOE provide even a skeleton structure for CSS task organization. The lessons learned from 3ACR's ODS/S experience, however, suggest a composition for echeloning CSS support into, and inside of, the theater of operations.

Field Manual 17-18 *Light Armor Operations* (Coordinating Draft) observes that "CSS operations during the early stages of a contingency operation mature at a pace dictated by the arrival of CSS assets into the area of operations. The nature of contingency operations demands that the bulk of initial forces to deploy are combat forces."³⁷ Nonetheless, the very scarcity of CSS support makes a coordinating element from the support squadron essential even in a forced entry scenario. Combat forces will have to take advantage of every possible opportunity for host nation, other service, or other nation's support without being distracted from their primary mission.

Taking advantage of the secured area held by elements of the 24th Infantry Division (Mechanized) a CSS command and control element from the Support Squadron 3ACR was the first regimental asset to deploy from the sea port of debarkation at Al Jubayl, Saudi Arabia. Under control of the squadron operations officer it also included a representative from the intelligence officer, and shortly afterwards one from the regimental material management center (RMMC) as well. This section secured

and laid out the RSA, reconnoitered the surrounding area (finding a rare source of free-flowing water), and coordinated with the local Sheik at the nearby town of An Nu'ayriyah. An examination of the TOE of the headquarters troop, support squadron 2ACR suggest that although hardly overstaffed, a similar forward control element is possible.

Unlike Support Squadron, 3ACR authorizations of 1990, but similar to its wartime operating strength, the TOE of 2ACR's support squadron provides for an operations officer (major), and intelligence officer (captain), a support operations officer (captain), a transportation officer (captain), and a chemical officer (captain). This complement of five commissioned officers is two more than supported by the 3ACR TOE during ODS/S, but typical of the number present due to overstrength staffing at that time. The addition of a support operations officer and a chemical officer as well as additional enlisted personnel and a warrant officer are due to inclusion of support operations, communications, and automation assistance offices to the S-2/3 (intelligence/operations) section, a total of twenty personnel.³⁸ The squadron TOE organization is at Fig. 10.

Complimenting the controlling capabilities of the S-2/3 section, the RMMC's fifty personnel "provides supply and maintenance materiel management for class I (include water management), class II (includes unclassified map supply), Classes III, IV, V, VII and class IX supplies."³⁹ The RMMC personnel provided to a forward element will vary with the logistical situation, but should include an officer with funds for local purchase. The property book officer, a captain, is a likely candidate for such

responsibility, as the warrant officer assigned to his section can maintain operations in his absence.

The property book section is authorized another useful resource, one of the squadron's three expando-vans.⁴⁰ Although the operations officer's HMMWV has the minimum communications capabilities to operate on frequency modulated (FM) and mobile subscriber equipment (MSE) radio (via mobile subscriber radio telephone), a van equipped with FM, MSE, and high frequency capability greatly enhances jump CSS tactical operations center (TOC) operations. The squadron is likely to deploy the property book section into theater late, if at all, and the section's van may be more useful for facilitating forward support.

With C² and limited material management established by the operations officer's jump TOC, essential material, maintenance, and medical elements are echeloned forward. Prior to availability of routine supply operations, FM 17-18 "Light Armor Operations" proposes accompanying and follow-on supplies for contingency operations of divisional operations that are also well-suited to 2ACR operations (Fig. 9).⁴¹ In the case of the RSA forward established by the operations officer's jump TOC, the primary mission will be management of accompanying reserve and follow-on supplies. As additional support squadron elements are echeloned into the support area, they form the first of two company-sized logistics teams. Figure 10 lists typical company team composition, initially under operations officer/jump TOC control.

The 2ACR support squadron's resources are sufficient to provide two similar, but not identical company teams.⁴² The squadron headquarters and the headquarters of

maintenance and supply and transportation troops provide C² elements. Material handling and internal support requirements are met by pooling such resources as forklifts and water trailers. Each troop also provides teams from individual sections to support the appropriate logistics function, such as a selection of ASL from the maintenance troop.

Manning

The 3ACR's ODS/S most severe manning requirements were housing and supporting replacements for casualties that never occurred, (a fortunate situation not to be counted upon in the future), and providing medical coverage on an area basis. During preparations for combat, area support medical requirements included, in addition to the above-strength regiment, elements of an aviation brigade, a field artillery battalion, a CSB, plus air defense artillery (ADA), engineer, and ordnance companies and postal and signal sections. The population supported was, at about 10,000 personnel, double the regiment's authorized strength.

In addition to the manning support provided by team's medical section, the company team can provides a convenient way station for personnel on their way to filling personnel shortages. If battlefield damage assessment and repair (BDAR) by the team's maintenance elements results in combat vehicles being returned to service, the team can also match returned-to-duty and new personnel with equipment to create crews. While such crews will not be certified, they can sight-in weapons, receive basic loads, etc. at the team site. This results in preservation of combat power at the most forward possible location. However, 3ACR's ODS/S experience was perhaps

atypical, in that sufficient replacement crews and personnel were available to man operational readiness float equipment, and to fill any possible combat losses.

Mature theater operations are increasingly uncommon in comparison to smaller, relatively austere force projections operations. The 2ACR will be more reliant on BDAR and returned-to-duty personnel for immediate combat power than 3ACR was in ODS/S, and performance of these functions by its logistical support teams similarly more critical.

A reflection of both the expected missions and value of medically preserving the fighting strength may be found in the composition of the 2ACR's medical troop. The provision of four additional surgeons and nurse anesthetists, plus medical-surgical nurses, etc. enables 2ACR to provide both level one medical support forward with the logistics company teams, and level two support in the RSA main. Surgical, blood, lab, radiological, and holding modules can reinforce a team's medical section to echelon support as required. A complete breakdown of the suggested 2ACR medical configuration is at Annex B.⁴³

Arming

During the short duration and limited contact experienced by 3ACR in ODS/S, ammunition resupply requirements did not even exhaust the 1½ basic loads carried at unit levels.⁴⁴ Reliance on such limited class V stocks is unlikely for 2ACR operations, but the ability to store, move, transload and issue ammunition forward in sector remains essential. Similarly, quantities carried on five ton dropside cargo trucks, stake-and-platform trailers (S&P's), and palletized loading system trucks, and

the ability to accept through-put from higher echelons limit 2ACR's logistics company teams arming capabilities.

Although effect of splitting the class V section's personnel and equipment into three areas (two teams and the main) reduces its total organic ability to process 500 to 600 short tons/day, this impact is partially overcome by the advantages of pooling material handling equipment (MHE) resources. However, wherever possible trailer transfer point operations at the team site can save time, preserve mobility and reduce wear on the MHE. The team can push Class IV (mines) and V (ammunition) forward to supported unit trains or to logistics release points, but limited C² and protection considerations make supply point distribution from the team area the preferred method.

Fueling

The 2ACR's support squadron has fifteen 5,000 gallon tankers, in contrast to the twenty-two authorized in 3ACR, but it also has two 2,500 gallon heavy expanded mobility tactical truck fuel tankers for internal resupply. Consumption, however, even in the regiment's mature configuration (armored gun system (AGS), M113, Paladin, et. al.) will not match that of the 3ACR's M1/M3 configuration.⁴⁵

The supply and transportation troop's TOE projects storage capacity of 113,600 gallons, and issue capability of 163,000 gallons of fuel daily, based on seventy-five percent truck availability and two trips per vehicle per day. This optimistic estimate is clearly based on supply point distribution from a single RSA area, with corps fuel assets only local haul distance away. Force projection operations may draw

on a variety of sources for fuel support, including airlift, host nation military, and civil stocks. Fuel tankers from the team site may draw fuel from sources other than the RSA main, in which case the squadron should assigned them the majority of assets.

Under more mature conditions, limited fuel assets in the team area will be replenished by trailer swap pushed from the RSA main, or by direct delivery of fuel from higher echelons of supply, as was sometimes the case in ODS/S. However, the otherwise advantageous fielding of 7,500 gallon fuel tankers at corps level has created one potential problem. Previously, COSCOM units under combat conditions could simply swap full tankers for a supported unit's empty ones at a trailer transfer points. Modernization has exchanged speedy swapping of full 5,000 tankers for empty ones for greater capacity per COSCOM truck.

If the regiment operates under the single fuel concept it maximizes the team's fueling capabilities. This fuel is normally JP-8, although JET-A (commercial aviation fuel) fuel is a possible and acceptable substitute. Besides the obvious advantage of avoiding the logistical complication of providing both diesel and aircraft fuel, filtering a single fuel through both the 5,000 gallon tanker systems and a fuel HEMTT results in a double-filtered product fit for aviation use. While a regimental aircraft could set down and fill up from virtually any HEMTT in the regiment, the team's fuel resources favor near or collocation of a Forward Arming and Refueling Point (FARP).

Fixing

Class IX (Repair Parts)

All regimental vehicles should carry a small selection of on-board repair parts, including adjustable engine belts and replaceable filters. Extremely limited maintenance sections at troop level will likely result in a single prescribed load list (PLL) maintained at squadron level, with only a selection of critical items available for operator and organizational maintenance. The logistics company teams will provide DS level repair parts and major assemblies for team and forward support platoon operations, and a limited selection of essential organizational repair parts. To project these parts in an organized and timely fashion will require two or three locations for each ASL item planned for team use. The class IX (repair parts) section must load one location for each company team, and one for the RSA main if sufficient assets are available. While management of the unit's most critical repair parts in three separate locations, both physically and electronically, is difficult and time-consuming, it is essential in insuring adequate stockage prior to deployment, and in asset visibility during operations.

In addition to formal ASL stocks, the company team must also carry PLL for internal operator and organizational use, and bench-stock items for DS repairs. Supply and transportation and maintenance troop PLL's are typically the most robust in the squadron, and are the best candidates for team use. Where there is no commonalty of assigned vehicles, such as supply and transportation heavy equipment transporters,

parts should be cross-leveled or authorized by the commander for stockage during normal operations.

Primary responsibility for transportation of ASL items lies with elements of the maintenance troop's main supply section. A repair parts storage van, supply van, and twenty-two and a half ton trailer provide parts warehousing and transportation for each team. MHE includes the 4,000 lb. forklift carried on a low-bed twenty-five ton trailer with an supply and transportation 6,000 lb. forklift.⁴⁶ One of the troop's three forward supply sections should manage warehousing of the ASL slice in each team, unless deployed down to supported squadron level.

Routine maintenance failures and battlefield damage can both overwhelm the limited class IX capability of the logistics team. Blackhawk (UH-60) helicopter support from the regiment's air reconnaissance squadron is essential to move high priority parts forward, and repairable major assemblies back to the RSA main.

Maintenance

The supply and transportation or maintenance troop maintenance platoons meet internal team maintenance requirements as they do for PLL. The maintenance troop of the 2ACR's support squadron is, at 216 authorized personnel, slightly more than one-half of the size of the 3ACR's maintenance troop. While much of their capabilities are similar in type, the depth of personnel and equipment in the 2ACR organization is considerably less.

Members of the forward support platoons already provide DS maintenance, and the company team can include only limited additional DS maintenance capability. Likely candidates for inclusion are personnel from the automotive maintenance section, including wheeled vehicle and fuel/electrical systems repairmen and power generation, construction equipment, and quartermaster/chemical equipment repairmen from the ground support equipment repair section. Welding and machining above contact truck capability are limited by available equipment to a single site, normally the RSA main.

Aviation Maintenance

The aviation unit maintenance troop of the air reconnaissance squadron can also enhance its capabilities by taking advantage of company logistics team sites and resources. As an intermediate recovery point, aircraft recovered back to the team may be secured on site or backhauled on empty supply vehicles. As the company team site is a relatively secure forward location, aviation maintenance personnel may be able to repair, replace, or disassemble for parts aircraft that they could not service otherwise. The power generation and lift capabilities offered by team assets are potentially valuable resources for aircraft maintenance forward in sector.

Moving

In a liner battlefield logistics team movement and positioning will be vertical or horizontal in relation to the forward edge of the battle area. In the case of 3ACR, positioning was primarily vertical. Teams had planned to leap-frog one another, but actually moved most frequently in column. As the lead team moved to a new, more

forward position, the rear team occupied the vacated site or another forward location. Occupation of a prepared, cleared site reduced exposure to mines, and allowed completion of selected maintenance and medical operations.

Leap-frogging company teams and movement in column is useful in pursuit operations, but defensive (and less mobile offensive) operations will require more lateral and less vertical projection. Teams may not have the advantage of moving into a recently vacated site, and will have to place more emphasis on site selection, security, and occupation procedures.

The supply and transportation troop's movement capability is unclear due to an inconsistency in TOE 424571000. It claims a four HET capability at eighty percent operational readiness (OR) rate, but fails to provide for any HETs in the detailed listing.⁴⁷ If the troop eventually receives HETs, the logistics team can use them as part of the BDAR process, i.e., vehicle recovery. Additional movement capability is possible in backhaul of enemy prisoners of war, damaged or excess material, etc. on S&P trailers returning to the RSA main.

Sustaining

Logistics company teams carry between them one day's rations for supported squadrons on five-ton dropside trucks or on an S&P trailer. These rations are assets above the three days typically held at individual and unit supply level. Water carried in 500-gallon water trailers is for team internal consumption. Logisticians will have to provide water for supported units in bottles, or by inclusion of a reverse osmosis water

purification unit from the water section, or by throughput and limited storage of bottled water.

The logistics company teams employed by 3ACR enjoyed a relatively secure, if lengthy main supply route (MSR), and encountered enemy soldiers mostly interested in water and food, not fighting. Virtually no resources were dedicated to MSR security once regimental forces had passed beyond it, and area security was limited to that provided by the logisticians. Some 3ACR techniques are, however, of value to 2ACR operations, as planning and training had not counted on such fortunate circumstances.

Perimeter Security

The basis for perimeter security for 3ACR operations was a standardized setup. Each time the company team occupied a new position, personnel fixed vehicle positioning, weapons system emplacement, fighting positions, and sub-unit responsibilities in relation to the entrance to the MSR. This technique not only speeded emplacement, it assisted customers in locating required maintenance or supplies, even in the dark under blackout conditions. The desert terrain, which consistently offered flat areas with easy access and good fields of view, facilitated a high level of standardization at team sites.

As important as standard operating procedures (SOP) were to 3ACR procedures, they are likely to be even more so in 2ACR. Force projection operations will not be limited to relatively featureless desert floors, so setup and security operations should be developed and practiced for a variety of terrain. Staking-in vehicle and fighting positions prior to occupation, a technique commonly used by advance parties

of the RSA main, should be incorporated into 2ACR logistics team procedures in open terrain. The squadron's division into main and team areas favors the use of built-up areas for logistics sites, commonly referred to as the village concept, insofar as smaller, less obvious sites become usable. On a note of caution, the 3ACR practice of either configuring support areas with tangential perimeters, or placing at least direct-fire weapons range apart to prevent fratricide will have to be even more closely attended to by 2ACR. The M19 40mm grenade launchers authorized to the new organization significantly enhance its organic defensive capability, but concurrently increase the dangers of friendly fires.

One security element employed by the 3ACR will be much more difficult for 2ACR to field. The 3ACR drew a platoon-sized quick reaction force (QRF) from maintenance headquarters troop personnel, and placed it under the direction of a headquarters troop non-commissioned officer in charge (NCOIC). Maintenance troop relieved QRF personnel of their usual duties, allowing them to drill extensively in basic infantry tactics, calls for fire, and to qualify as combat lifesavers. Support squadron use the QRF extensively for external perimeter patrols, and it prepared for perimeter reinforcement and mass casualty operations. In particular, the QRF provided additional security for the lead company team in the assault.

The significantly smaller size of the 2ACR's maintenance troop will make it proportionally more difficult to devote personnel full-time to a QRF. At a minimum, the squadron should prioritize selected personnel for additional individual training, such as combat lifesaver and nuclear, biological, and chemical courses. QRF sections

must qualify as crews on M19, M60 and M2 machine-guns, and periodically meet for squad and platoon level training.⁴⁸

Route Security

The absence of route security in ODS/S was a unique case. For 2ACR operations, regimental or corps resources beyond those of the support squadron will be required to prevent supply line interdiction. There are, however, internal procedures that help minimize hazards.

The two most valuable pieces of equipment for a logistics convoy are a radio and a global positioning system (GPS). The mobile nature of cavalry operations results in frequent movement of both supported and supporting units, and convoy commanders will frequently be enroute to places for their first time. While the featureless desert made GPS a virtual necessity for off-MSR movement, it is equally valuable for locating the six-digit grid representing an entrance to a new logistics site, in hilly terrain, in the dark, and under blackout conditions. Unfortunately, GPS authorizations in the current TOE are insufficient to insure that DS maintenance teams, ambulances, advance parties, convoys and other moving parts of the logistics structure will all have access to one. In lieu of additional authorizations, squadron headquarters should centrally control GPS equipment.

In concert with GPS utilization, radio equipped vehicles are essential for convoy movement. The use of common table of allowance's authorized hand-held radios may enhance communications within a convoy serial. However, contact with units on both ends of the convoy route helps track passage from checkpoint to checkpoint, may

prevent vehicle movement into interdicted areas, and enables coordination to prevent fratricide. This requires the use of sparse vehicle-mounted equipment. Given limited GPS and radio assets, dedicated convoy escort vehicles and personnel, taken from their normal duties, are a painful but advisable procedure.

Despite all security precautions taken by the support squadron, the regiment may have to provide additional security measures. These could include overflying of the MSR, allocation of attached military police, and even operational control of combat elements for MSR and convoy escort duty.

Air Defense

Small arms for air defense training is essential, with individual and crew served weapons maximizing fires. Unfortunately, the limited range of these weapons restricts them to revenge shots, the enemy's ordnance having already been launched. Where tactically expedient, the regiment should station one or two of its air defense artillery (ADA) battery's twenty-four Avenger missile units with each company team. In addition to their obvious air defense use, the forward looking infrared sights on these systems can contribute significantly to the team's night time security.⁴⁹ Company team locations may also be suitable for collocation of ADA maintenance assets.

The XVIII Airborne Corps Perspective

XVIII Airborne Corps planners are considering 2ACR for traditional cavalry missions and for use in METT-T derived ones, including participation as a rapid reaction force. While major operations plans envision utilization of the entire regiment,

contingency planning for crisis response operations focuses on smaller deployments, particularly into immature theaters. CSS planning must be flexible enough to provide support from troop through regimental-sized deployments, under logistical environments ranging from the non-existent to the fully mature.⁵⁰

IV. CONCLUSION

This section reviews the feasibility and suitability of support squadron, 3ACR organization and techniques from ODS/S for 2ACR standard use. It summarizes results by logistics function, and makes recommendations for support squadron 2ACR organization and training.

As explored in Chapter II, 3ACR logistics innovations centered about the support squadron's reorganization for combat into an RSA main, a mobile command group, and two logistics company teams. Operations in ODS/S ranged from austere conex-to-customer support during early defensive operations, to a logistics pursuit supported by a complete COSCOM structure. Although the squadron was exploring reorganization for combat shortly before deployment, its organization and mission varied significantly from prior practice and expectation. Examination by logistics function reveals the strengths and weakness' of 3ACR ODS/S techniques as standard 2ACR procedures.

Manning

The 3ACR's ODS/S medical support procedures are not only feasible and suitable for 2ACR, but the greatly enhanced capabilities of 2ACR's medical troop

make possible an organic level of support superior even to the enhanced capabilities of augmented 3ACR operations. The greater number of physicians requires additional effort to insure that peacetime unit training includes those who actually deploy with the unit.

Fueling

With twenty-two organic 5,000 gallon fuel tankers, 3ACR never suffered for lack of organic fuel distribution. Although 2ACR has only fifteen such tankers, it consumes significantly less fuel than 3ACR. While certainly feasible, suitability of forward positioning of fuel tankers depends on turn-around time and security considerations. The squadron's authorized forward area refueling equipment (FARE) systems should be augmented by a fuel system supply point, to allow forward fuel positioning without immobilizing transportation assets.

Fixing

Unlike the medical troop, 2ACR's maintenance troop is considerable less robust than 3ACR's. While sustaining 2ACR's vehicles (AGS, M113A3, and Paladin) is less demanding than providing for those in 3ACR (M1A1, M3A2, and M109), a lack of redundancy in personnel and equipment limits flexibility.⁵¹ A selection of critical ASL included as part of each logistics company team, will facilitate DS maintenance operations by the maintenance troop's forward support teams. Equipment not repairable by forward support teams (items requiring test equipment or heavy welding) must be evacuated to the RSA main. Forward positioning of additional DS

maintenance assets is suitable, but not feasible, due to limited personnel and equipment. As a result, forward positioning of a portion of the ASL is not only feasible, but necessary due to increased repairable exchange (RX) requirements.

Protecting

The smaller size of 2ACR's maintenance troop reduces the number of personnel available for deployment with company logistics teams, and therefore reduces their ability to provide self protection. Use of some of the squadron's eight M19 40mm grenade launchers (not available in 3ACR) and nine M2 .50 machine guns will help, but collocation with ground squadron field trains may often be a necessity.

Protection of the regiment's internal supply lines is situationally dependent, but they are unlikely to prove as secure as those in ODS/S. The 2ACR should expect the use of supply convoys between the RSA main and the company teams, supported by aerial reconnaissance, and possibly with combat vehicle escort.

The almost total reliance on self-protection of logistic sites is less feasible and less likely to be suitable for 2ACR operations than was the case for 3ACR. The 2ACR can expect regimental augmentation of support squadron assets with combat vehicles to be the norm, not the exception.

Recommendations

The organization for combat proposed in Chapter III will allow 2ACR to echelon logistics support in time and in space. In addition to the leap-frogging of support in the offensive, as executed by 3ACR, the logistics company team configuration

is well-suited to support the regiment's other potential missions. Figures 12, 13, and 14 illustrate examples of echeloned logistics support in defensive, screening, and forced entry operations.

To achieve tactical and technical proficiency utilizing the logistics team concept will require development of SOP's, and routine exercise of the configuration. The support squadron should permanently identify personnel and equipment for each team, the command group, and the RSA main, including appropriate vehicle and equipment markings. Little or no utility is lost when company teams are collocated with the RSA main, so absorption back into a single perimeter, organized by discreet unit should be discouraged. Perimeter, reaction force, and LOC security operations supported by regimental air and ground combat elements require SOP's and rehearsal, and will be competitors for scarce training resources. With these considerations, 2ACR logistical operations can build on the foundation of responsive, flexible CSS support laid down by 3ACR logisticians in Operations Desert Shield and Desert Storm.

ENDNOTES

¹U.S. Army, *FM 63-1 Support Battalions and Squadrons, Separate Brigades and Armored Cavalry Regiments (Draft)*, (Fort Lee: Department of the Army, electronic media files dated 21 August 1993), p. B-1.

²Littel, MAJ Mark T., "The Light Armored Cavalry Regiment-- Reconnaissance Force of the Future", (Advanced Military Studies Monograph, U.S. Army Command and General Staff College, December 1992), pp. 2-3.

³U.S. Army, "Executive Summary, TOE 17460L000 2nd Armored Cavalry Regiment (Army of Excellence)", (Fort Knox: Department of the Army, not dated.), p.1 encl. 1.

⁴*Ibid.*

⁵For example, the mission statement of the support squadron in August 1988 was simply "The Support Squadron is a REFORGER 2 + 10 Unit prepared to alert and deploy to Europe. After POMCUS draw, the Squadron is prepared to execute contingency missions assigned." Original briefing (electronic media) in the authors possession.

⁶*FM 63-1 (DRAFT)*, p.

⁷The latest manual available at the time of this writing was Appendix B, "Support Squadron 2nd Armored Cavalry Regiment" of *FM 63-1 Support Battalions and Squadrons, Separate Brigades and Armored Cavalry Regiment (Draft)*.

⁸*FM 63-1 (DRAFT)*, p. 5-6.

⁹Conversation between support squadron operations officer (the author) and the support squadron commander (LTC Mongeon), about 0500 27 March 1991.

¹⁰The author spent two tours with the support squadron, 3ACR. Where not otherwise documented, observations and conclusions about 3ACR operations are based on his personal observations, per his unpublished paper "Care and Feeding of Cavalry at the Turn of the 20th Century."

¹¹Prior to formal activation of the support squadron, it had existed as a provisional element composed of the 513th Maintenance Company and the Regimental Troops: the 66th Military Intelligence Company, 43rd Engineer Company, Regimental HHT, and three chemical platoons. The support squadron activated a Supply and Transportation Troop, Medical Troop, Adjutant General (now Personnel Services)

Company, HHT, and absorbed the 513th Maintenance into a Maintenance Troop. Eventually, the other Regimental Troops were attached to ground (M1/M3) squadrons.

¹² The doctrinal operations implemented by the first non-provisional support squadron commander, LTC James R. Dickson, Jr., were refined during the tenure of the second, LTC Oscar L. Major.

¹³ COL Mongeon is currently the Commander, 41st Area Support Group, Panama.

¹⁴ Although the term 'Task Force' was used by 3ACR, 'company team' is used here to insure the reader's understanding of these logistics elements as company-sized, not squadron sized operations.

¹⁵ Estimate based on the author's personal observation.

¹⁶ Regimental logistics planners included the support squadron commander, his operations officer, the Regimental Material Management Officer, and the Regimental S-4. The planning group was eventually expanded to include the commander and Logistics Operations Officer of the 553d CSB.

¹⁷ Although the regiment's automation officer, an infantryman with an ADP functional area, did command Task Force Bravo, the squadron's Executive Officer had to temporarily return stateside due to a family emergency and was replaced by the senior Troop commander as commander of Task Force Alpha.

¹⁸ According to the Regimental S-4 of the time, after successive failures to establish AM communications, these radios were frequently tuned to the British Broadcasting Company's frequency. In that way they at least provided news to an information-starved group of staff officers.

¹⁹ *FM 63-1 (DRAFT)*, p. 10-14.

²⁰ Echelons of medical support are defined by U.S. Army, *FM 8-10 Health Service Support in a Theater of Operations*, (Washington: Department of the Army, 1 March 1991), pp. 3-3 - 3-5:

Echelon I (Level I): From first aid to care provided by a physician at a Battalion Aid Station. This level of care includes immediate lifesaving measures, disease and nonbattle injury prevention, combat stress control preventive measures, casualty collection, evacuation from supported units to supporting medical treatment and treatment provided by personnel of a treatment squad up to and including a physician, with measure emphasis placed on those measures necessary to stabilize and allow for the evacuation of the patient to the next echelon of care.

Echelon II (Level II): This echelon of support duplicates Echelon I... and expands services available by adding dental, laboratory, x-ray, and patient holding capabilities. Emergency care, including beginning resuscitation procedures, is continued. (No general anesthesia is available.) If necessary, additional emergency measures are instituted; however, they do not go beyond the measures dictated by the immediate need. Those patients who can RTD within 24 to 72 hours are held for treatment. This level of care is provided by: Support battalions of separate maneuver brigades, support squadrons of ACRs, Support battalions of DISCOMs (heavy divisions), medical battalions of DISCOMs (airborne and air assault divisions) and nondivisional medical battalions (corps and COMMZ).

²¹ Martin, MAJ Bryan, "Medical Coverage of the Regiment in Pursuit", p. 4. Concerning the permanent medical element forward with each company team, MAJ Martin notes that "although the medical support provided each task force was substantial, it was not adequate for large numbers of casualties, and did not provide for level two medical care; indeed... each was similar to the Squadron Aid Station."

²² Martin, Medical Coverage of the Regiment in Pursuit, p. 6. Additional medical assets provided to the 3ACR included 6 UH-60's from the 57th Medical Detachment, 6 UH-1's from the 374th Medical Detachment (RA), and 10 M997 wheeled ambulances from the 690th Ambulance Company.

Martin, "Experience of a Far Forward Medical Unit in Operations Desert Shield and Storm" To maintain the fast pace the Clearing Station was divided into four major sections: two advanced medical treatment teams made up of a physician, a physician's assistant and approximately 8 medics working out of an armored vehicle and supported by 5 ambulances and crews, the Clearing station (minus) made up of 2-3 physicians, a physician's assistant, the two wards and assigned personnel, the lab, x-ray, pharmacy, and blood product support, the 2 air ambulance detachments and mechanical, administrative and communications assets needed to support the main medical effort, and a fourth medical contingent which stayed at the base camp in northern Saudi Arabia to provide support to the base camp and the main prisoner of war holding compound. The two advanced medical teams "leapfrogged" over one another in an attempt to have constant, close, medical support for the Cavalry. The main clearing station moved with the rearmost of the two advance medical teams as they leapfrogged forward.

The main clearing station was divided into smaller units which could be moved by helicopter wherever needed. i.e. if the furthest forward medical team had enough patients that they needed a ward, a 20 bed ward tent, its equipment and personnel could be flown forward to support them. The ability of the air ambulances to quickly move patients to fully functioning hospitals and to quickly augment movement of medical personnel and supplies was critical to the success of the 3ACR clearing station.

²³ Martin, Medical Coverage of the Regiment in Pursuit, p. 5.

²⁴ Martin, Medical Coverage of the Regiment in Pursuit, p. 8.

²⁵ Jet-A is commercial aviation fuel, widely used in ODS/S. It is essentially JP-8 without the deicing additives.

Gasoline was required by 4.2KW generators used to provide auxiliary power to TOC M577's. DF-2 was required to power the 6 FUCH's chemical reconnaissance vehicles. Although quantities required were small, the addition of these separate fuels meant the dedication of HEMTT fuel tankers removed from general support of the regiment.

²⁶ FM 63-1 (DRAFT), p. 6-16. The 170,000 gallons a day figure is from an original briefing chart in the author's possession.

²⁷ Based on my estimates done in the support squadron's operations section prior to planning for fuel system supply point use.

²⁸ One particularly good indicator of the regiment's fuel status was its ability to fight 'on forward tanks' alone. The M1A1 has two fuel cells. Normal operations result in refueling prior to shifting to the second, or forward, cell and having to do so is a good indicator that fuel supplies are stretched. Although non-stop, 3ACR/553d CSB fuel support was sufficient to enable operations on rear tanks alone.

²⁹ Memorandum from MAJ Kevin Benson, XVIII G-3 Plans officer, to MAJ John Friedson, subject: "XVIII Airborne Corps Utilization of 2ACR," dated 18 November 1993, p. 1.

³⁰ "Executive Summary, TOE #174600L p.1 encl. 1.

³¹ U.S. Army, "Operational and Organizational Plan, TOE 17460L000 2nd Armored Cavalry Regiment (Army of Excellence)", (Fort Knox: Department of the Army, not dated), not paginated.

³² Operational and Organizational Plan, TOE 17460L000, not paginated.

³³ FM 63-1 (DRAFT), p. B-3.

³⁴ FM 63-1 (DRAFT), p. B-2

³⁵ TOE 17460L000 Executive Summary, not paginated.

³⁶ FM 63-1 (DRAFT), p. B-2.

³⁷ U.S. Army, *FM 17-18 Light Armor Operations (Coordinating Draft)*, (Fort Knox: Department of the Army, 1 September 1992), p. 8-4.

³⁸ U.S. Army, "TOE NO. 63456LO Headquarters and Headquarters Troop, Support Squadron, Armored Cavalry Regiment", (Washington: Department of the Army 1 Oct (no year)), p. 74-80.

³⁹ U.S. Army, "TOE NO. 63456LO Headquarters and Headquarters Troop, Support Squadron, Armored Cavalry Regiment", (Washington: Department of the Army 1 Oct (no year)), p. 71.

⁴⁰ Truck Van: Expansible MTV W/E LIN Z17296.

⁴¹ *FM 17-18 (Coordinating Draft)*, p. 8-4, 8-5.

⁴² MHE, supplemental medical teams, and supplemental maintenance teams will have to be prioritized.

⁴³ This extensive breakdown of 2ACR's medical configuration was provided by Dr. (MAJ) Bryan Martin. It is included here as 2ACR's enhanced medical troop is significantly different from that organic to 3ACR.

⁴⁴ As class IV was both in short supply and relatively useless in desert pursuit operations, the space it normally would have consumed, as well as all other available areas, was exploited for storage of additional class V at the unit level.

⁴⁵ For example, in "The Armored Gun System: Sheridan Replacement Offers Better Firepower Plus Worldwide Mobility," CPT John Nagl note that the AGS is expected to achieve a 300 mile cruising range on 150 gallons of fuel, or two miles to the gallon. This compares to the M1A1 with a capacity of 505 gallons, which can expect to use about two gallons for each mile!

⁴⁶ Two or more of the four flatbed five ton trailers in supply and transportation troop may be required to fill forklift transportation requirements in the logistics company teams, as only one low-bed trailer is authorized in the support squadron, per TOE 42457L000.

⁴⁷ U.S. Army, "TOE NO. 424457LO Supply and Transportation Troop, Support Squadron, Armored Cavalry Regiment", (Washington: Department of the Army 1 Oct (no year)), p. 93.

⁴⁸ This system was used by support squadron, 3ACR prior to ODS/S. Its success varied with the command emphasis it received, but performance at NTC rotations suggest that method is viable, if not optimal.

⁴⁹Two other considerations must be made when using Avengers for night time security missions. First, the FLIR may burn out if overused, limiting use of a single system to periodic sweeps, or two systems to alternate sweeps. Second, air defense crews also require rest, and cross-training of other personnel on at least the FLIR should be considered.

⁵⁰Memorandum from MAJ Kevin Benson, XVIII G-3 Plans officer, to MAJ John Friedson, subject: "XVIII Airborne Corps Utilization of 2ACR," dated 18 November 1993, p. 1.

⁵¹Nagl, p. 26. Concerning design considerations, "the AGS had to be able to fight for long periods of time with minimal external support."

ANNEX A

ILLUSTRATIONS

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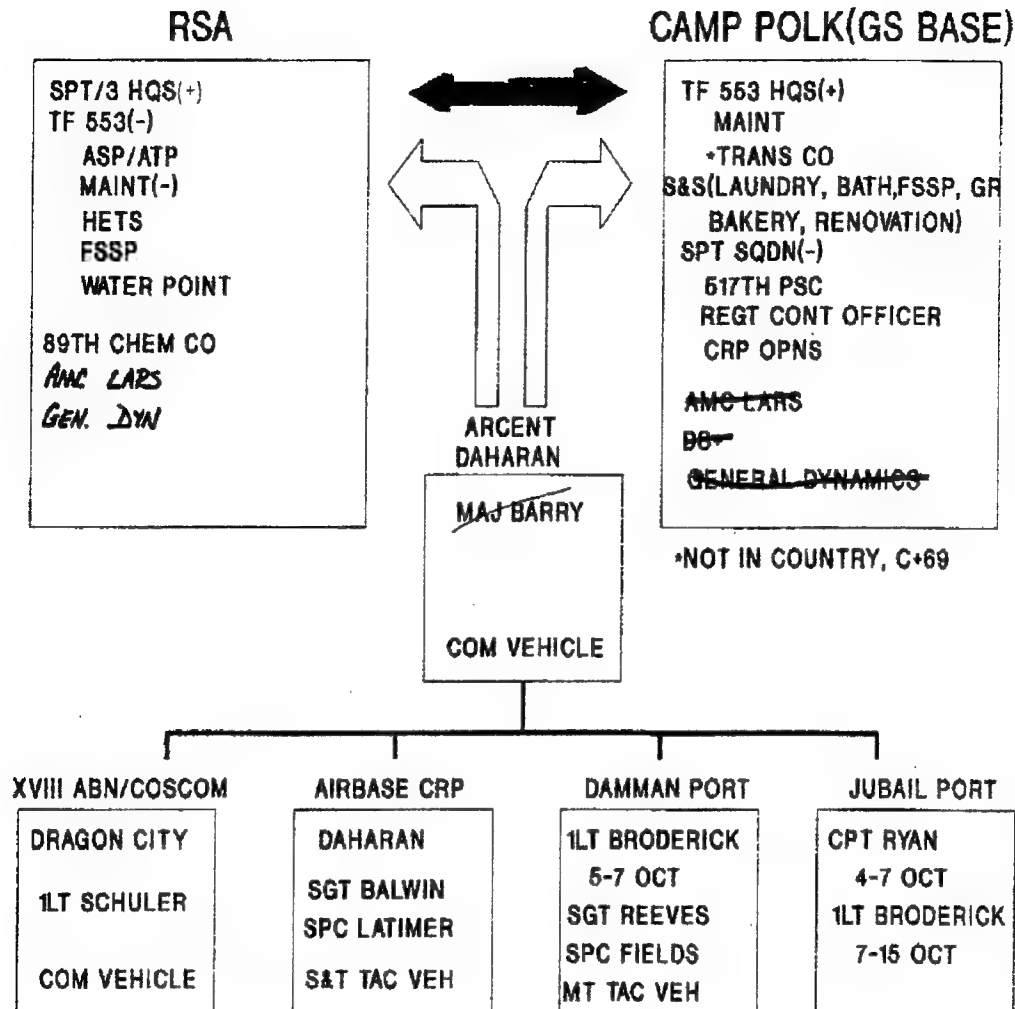


Fig 1. Lack of theater infrastructure required extensive use of liason teams to echelon control of supplies from air, land, and sea lines of communication. (From original 3ACR viewgraph.)

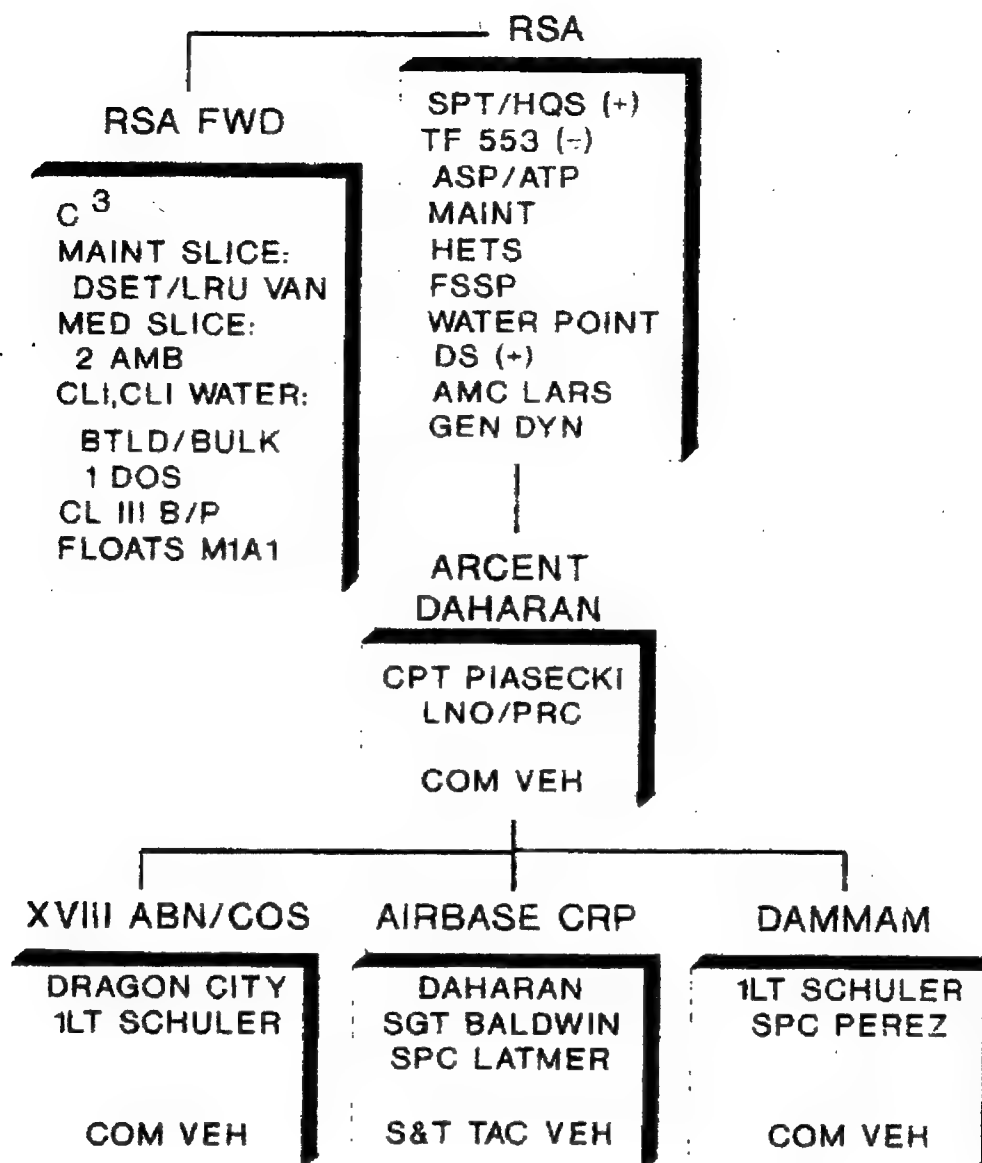


Fig 2. After regimental combat forces set up defense forward of the Tapline road, an 'RSA Forward' was deployed north as well. Many of the SOP required for operation of the 'Task Forces'--really logistics company teams--were worked out while exercising this organization.
(Scanned from the original 3ACR viewgraph.)

TASK FORCE SETUP

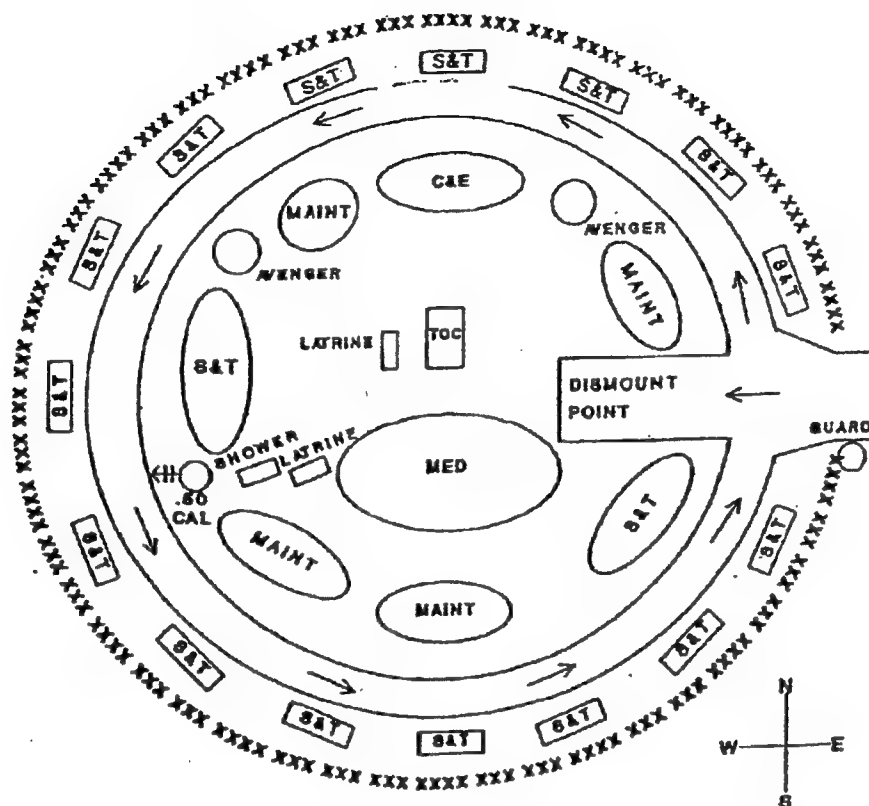


Fig 3. Layout of the 'RSA Forward' projected north of the Tapline road during regimental defensive operations, Operation Desert Shield. (From original 3ACR viewgraph.)



Support Squadron Regimental Operations

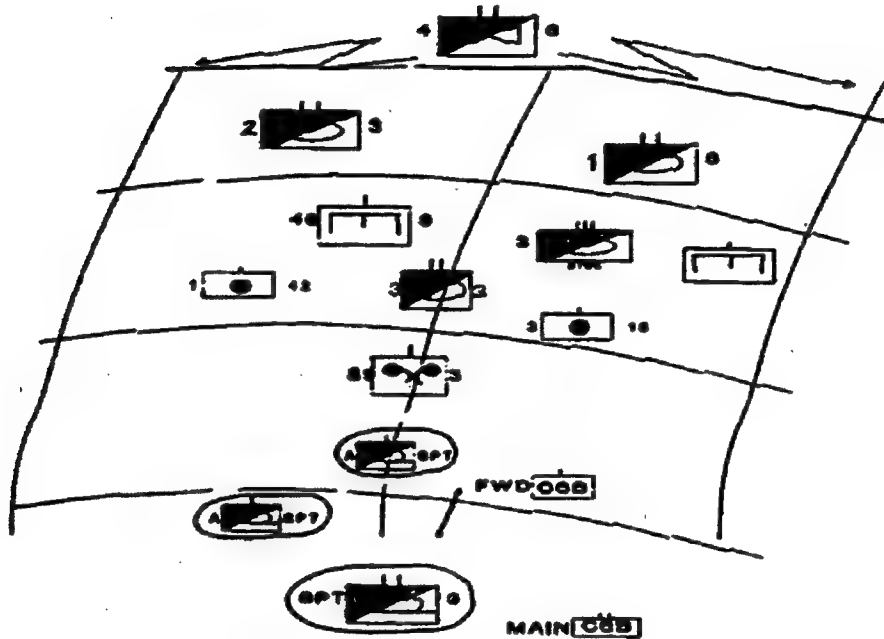


Fig 4. Battlefield layout with use of logistics company teams.
(From original 3ACR viewgraph.)

Class/Unit	HHT	Supply & Transportation	Medical	Maintenance
Command & Control	RDC OIC/NCOIC	XO/Senior LT	Trp Cdr/	TRP Cdr/Senior LT
Material Management	RMMC Maintenance Mgt Officer	Representatives from Supply, Petroleum, and TMT platoons		Tech Supply NCO
Class I		1 X 5 Ton Dropside, 1X 5T S&P (MREs/T-Rat)	Water Trailer	
Class III	On-board CL III (P)	1 X 5 Ton, plus on-board CL III (P) 5-10 X 5K DF2 1 X TPU MOGAS	On-board CL III (P)	On-board CL III (P), plus DS bench stock requirements 3DOS, usually in 55 gal drums.
Class IV	On-board wire/picketts	Total of 10 X 5T dropside, 4 X 5T S&P with Mines/Wire/Picketts /Ammo 7.5T Crane, 6K Forklift. *	On-board wire/picketts	On-board wire/picketts
Class V			CL VIII & Medical 3 Tracked Ambulances, 3 M577 (Clearing Station), 4 X 2.5T CL VIII (Mod Med)	
Class VII				M1/M3 float
Class VIII & Medical	Combat Lifesavers	Combat Lifesavers		Combat Lifesavers
Class IX & Maintenance	On-board PLL, Wrecker	On-board PLL 2 X HET	On-board PLL	On-board PLL, Maint Trp PLL*, 9 Vans ASL Slice, DSETS, 1 Commo Repair Van, M88, 2 5KW Gen., 2 10K Forklifts
* These elements provided by S&T or Maintenance Troop, aligned with Team HQ				

Fig 5. Typical 3ACR logistics 'Task Force' composition. On-board (carried on each vehicle) barrier material, packaged POL, and selected PLL items enhanced internal maintenance and security operations.



TASK ORGANIZATION

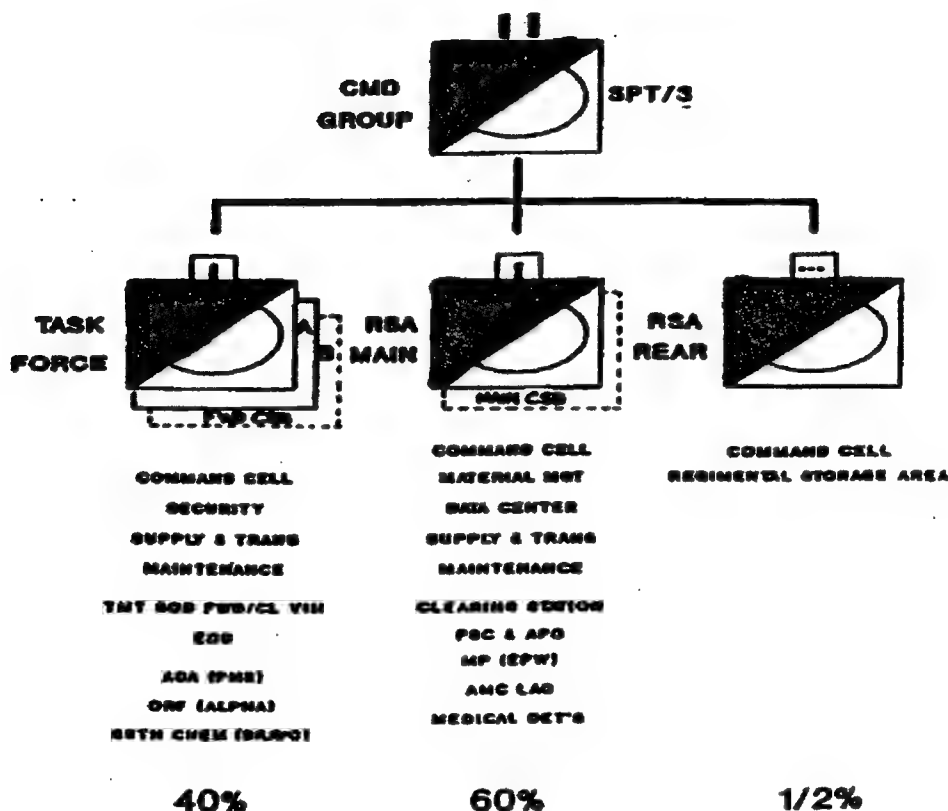


Fig. 6. Support Squadron 3ACR distribution of resources during operation Desert Storm. Only fully mobile assets went forward as part of the logistics 'Task Forces.' A small cell still remained in the regimental storage area, the old 'RSA Forward,' guarding supplies and equipment left behind when the regiment moved west.
(From original 3ACR viewgraph.)

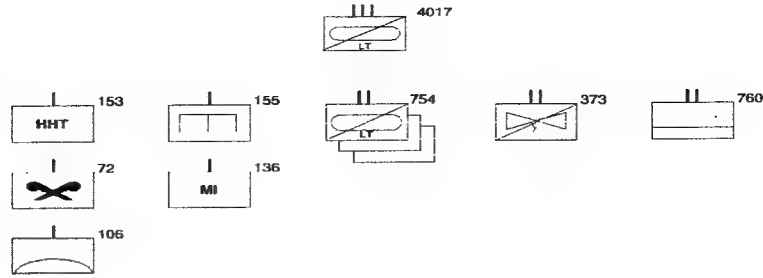


COMBAT LOGISTICS-DOS

	DDDM/SET CO	ALPHA	BRAVO	CSB PWD	SEA MAIN/ CSB MAIN
I	3 DOS	1 DOS	1 DOS	2 DOS	6 DOS JOINT OPNS
WYER	3 DOS	1/2 DOS	1/2 DOS	1/2 DOS	3 DOS JOINT OPNS SDE/6 ROWPU
III BULK	170K	130K		PEEP FWD 70K TAKERS 60K	PEEP MAIN 100K TAKERS 30K
JPS	1 DOS	3/4 DOS		3/4 DOS	1-1/4 DOS
III (P)	3 DOS	1 DOS	1 DOS	2 DOS	18 DOS 8 DOS
V	CBT LOADS 1-1/2 DOS	CBT LOADS 1/2 DOS		CBT LOADS 1/2 DOS	THROUGHPUT FROM CORPS AND THEATER
VIII	2 MOD MED	8 MOD MED	7 MOD MED		16 MOD MED
IX	ON-BRD PLL	ESC C FUPP LRU PEMA	FUPP LRU PEMA		ASL SEA MAIN

Fig. 7. Division of supplies in estimated days-of-supply (DOS) just prior to the attack into Iraq. Estimates of ammunition consumption proved to be pessimistic, as little enemy resistance was encountered. (From original 3ACR viewgraph.)

LIGHT CAVALRY REGIMENT **INITIAL TRANSITION**

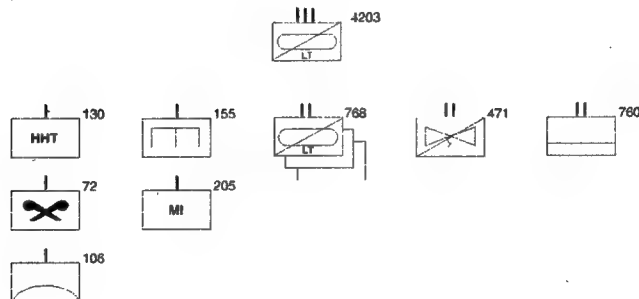


CHARACTERISTICS

HMMWV (SODNS) - 402	155MM HOW (T) - 24
HMMWV TOW - 108	SEE - 6
MPLH - 33	ACE - 6
120MM MORT - 18	VOLCANO - 3
	MICLIC - 3
	AVENGER - 18
	NBCRS VEH - 8

LCP85
4 AUG 92

LIGHT ARMORED CAVALRY REGIMENT **TRADOC RECOMMENDATION** **OBJECTIVE (1999) DESIGN**



CHARACTERISTICS

M113A3 - 180	SEE - 6
AGS - 114	ACE - 6
155MM HOW (SP) (PALADIN) - 24	VOLCANO - 3
MPLH - 36	MICLIC - 3
UH 60 - 7	AVENGER - 18
UH 60 (C2) - 8	NBCRS VEH - 8
120MM MORT - 18	

LCP896
30 JUL 92

Fig. 8. 2ACR Composition. The 2ACR will be transformed from a very light, HMMWV-based organization to one with armored gun systems, M113A3 armored personnel carriers, and Paladin 155mm artillery. (From CASCOT briefing to Army Chief of Staff.)

ACCOMPANYING	Issued prior to marshaling, carried into or airdropped in the assault; include unit, force, and reserve supplies.
Unit	Individual and system basic loads.
Force	Bulk supplies at Battalion or Brigade S-4
Reserve	Additional supplies under DISCOM control. Include assault force reserve of CL III, V, II, IV and IX.
FOLLOW-ON	Pre-packaged supplies for immediate delivery during after initial assault.
Automatic	Once daily delivery of supplies according to pre-planned schedule.
On-Call	Pre-packaged by type, or maintained in bulk, may include major items of equipment. Emergency delivery <24 hrs., routine 24-72 hrs after request.

Fig. 9. FM 17-18 'Light Armor Operations' accompanying and follow-on supplies for contingency operations. These categories are suitable for 2ACR logistic operations, with 'Accompanying Force' supplies carried by the lead logistics company team.

Class/Unit	HHT	Supply & Transportation	Maintenance
Command & Control	S-3 is OIC until first Troop HQ deploys.	Supply Plt Ldr until troop HQ with XO or CDR arrives.	FWD SPT Platoon Leader until troop XO or CDR arrives.
Material Management	Element w/S-3 until MMC van is on site.	Supply Plt Ldr plus representative from Supply, Petroleum, and TMT platoons	Tech Supply NCO
Class I		2 X 5 Ton (MREs)	
Class II, VI		Supply Platoon Forklift 4K*	
Class III	On-board CL III (P)	1 X 5 Ton, plus on-board CL III (P) 4 X 5K DF2 1 X TPU MOGAS	On-board CL III (P), plus DS bench stock requirements 3DOS, usually in 55 gal drums.
Class IV	On-board wire/picketts	2 X S&P Mines/Wire/Picketts	On-board wire/picketts
Class V		2 X S&P TOW/155	
Class VII			M1/M3 float
Class VIII & Medical	Combat Lifesavers	Combat Lifesavers	Combat Lifesavers
Class IX & Maintenance	On-board PLL	On-board PLL 2 X HET	On-board PLL, Maint Trp PLL*, ERC C ASL, LRU/PEMA 2 X vans, 2 X S&P. Wrecker
* These elements provided by S&T or Maintenance Troop, aligned with Team HQ			

Fig. 10. Typical Company Team Composition, minus Medical Troop (see Annex B). Initially under control of the S-3, control of the two Company Logistic Teams passes to S&T and Maintenance Troops as additional elements arrive. Static elements, those not part of the company teams in the RSA Main are under the centralized command of the HHT Commander

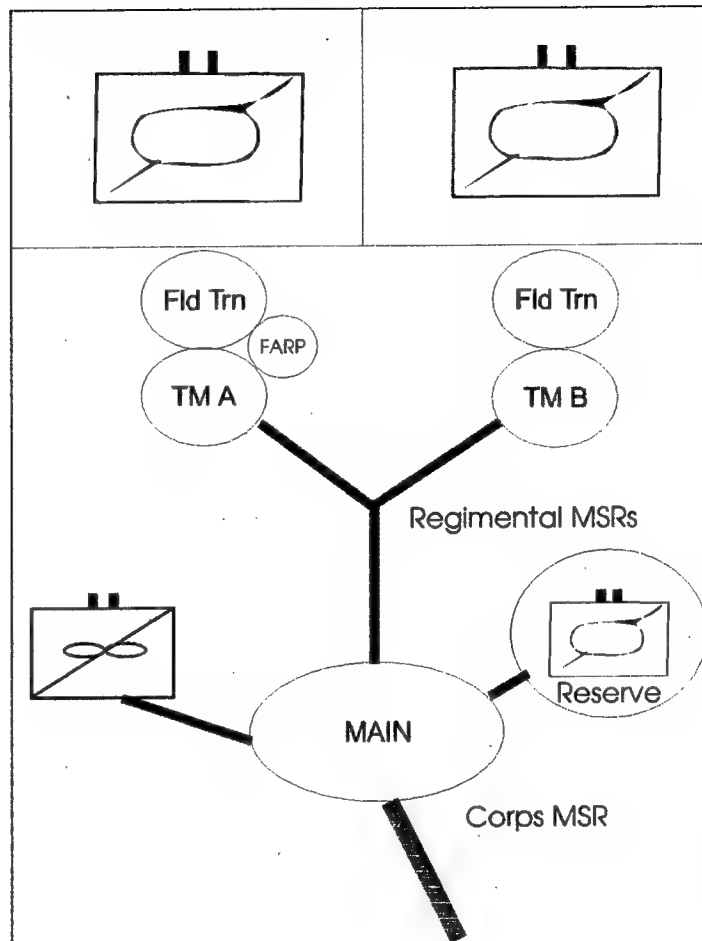


Fig. 11 . Use of 2ACR logistics teams in the defense. The RSA Main is out of enemy indirect artillery fire range, and projects support forward to logistics teams co-located with the field trains of the on-line squadrons. A forward arming and refueling point (FARP) has also co-located with a company team for supply support and mutual protection. The squadron in reserve, and the aviation reconnaissance squadron draw support directly from the RSA Main.

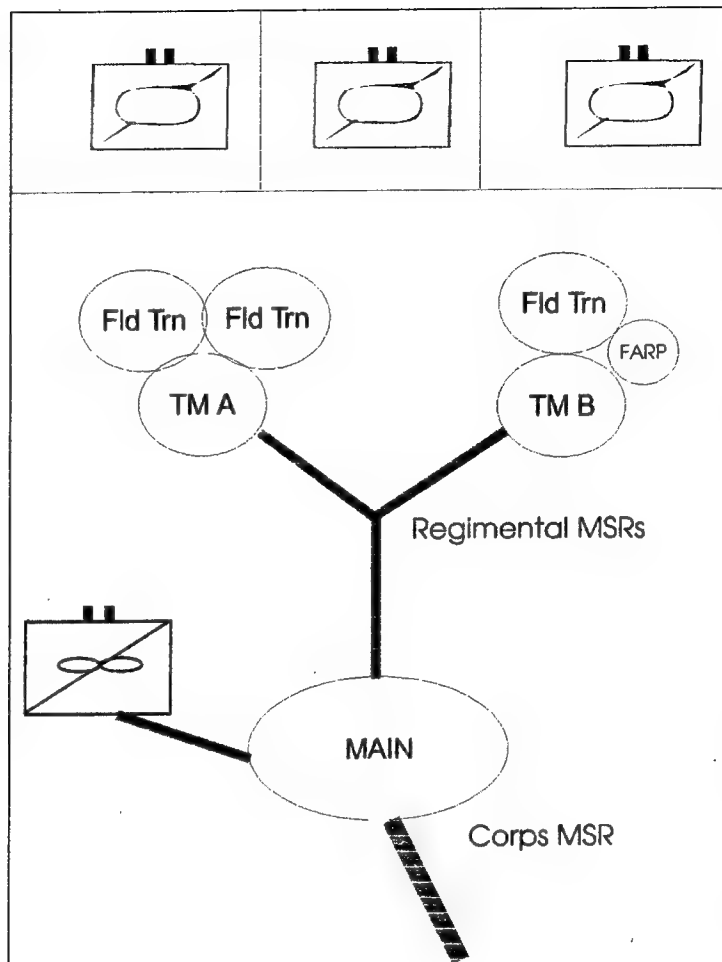


Fig. 12. Use of 2ACR logistics teams in the defense or performing a screening operations. The RSA Main is out of enemy indirect artillery fire range, and projects support forward to logistics teams co-located with squadron field trains. Two field trains have located with one team, as the support squadron's limited resources will not allow it to field more than two without augmentation. A forward arming and refueling point (FARP) has also co-located with the company team supporting only a single ground squadron. The aviation reconnaissance squadron draws support directly from the RSA Main.

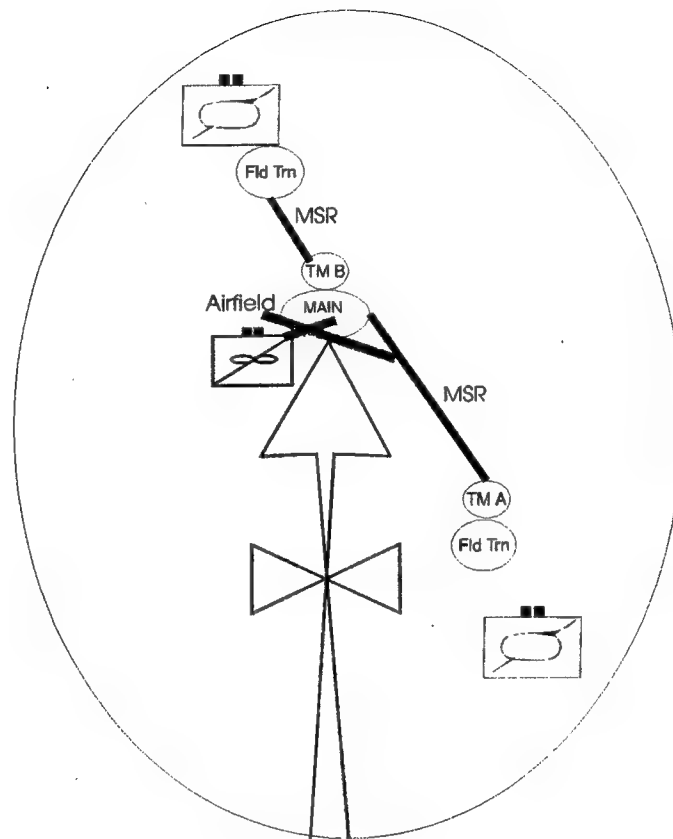


Fig. 13. 2ACR logistics team operations during forced entry operations. Support for this operations is ALOC, with the first team deployed now having formed the RSA Main, and the second positioned in the south supporting an expansion of the perimeter. When the balance of the support squadron's assets arrive, a second team will become available.

Annex B

Detailed Medical Troop Configurations

Company Team Medical Section

Total Personnel: 14

Officer: 3

Enlisted: 11

Vehicles: 5

OIC: Medical Service LT:

(With two teams deployed in addition to the main, one will be headed by the Ambulance Platoon Leader, the other by the Health Svc Mat Officer (RMSS).

Treatment Section

One full Treatment Squad (8 total personnel)

CPT: Field Surgeon, 62B

1LT: PA

Emergency Trmt NCO E6: 91B30 (NCOIC)

Emergency Trmt NCO E5: 91B20 (2)

Medical specialist E4: 91B10 (1)

Medical specialist E3: 91B10 (2)

Truck Utility: cargo/troop carrier 1-1/4 4x4 (HMMWV): 2

Trailer cargo: high mobility 3/4 ton: 2

Antenna Group: OE-254()/GRC

Medical equipment set: sick call field (2)

Medical equipment set: trauma field (2)

25 outlet light set

3 kw generator: skid mtd

RMSS Section

Medical supply SP E3 or 4: 76J10

Truck Cargo: 4X4 LMTV W/E

Ambulance Section

1 Ambulance Squad (4 total personnel)

Aide/Evac NCO E5: 91B20 (2)

Ambulance Aide/Driver E3 or 4: 91B10 (2)

Truck Ambulance: 4 litter armd 4x4 W/E (HMMWV) (2)

RSA Main Medical Section

Total Personnel: 90

Officer: 22

Enlisted: 68

Troop Headquarters (21 Personnel)

Commander: 62B MAJ, MC

Medical Operations Officer: 70B67, CPT MS

First Sergeant: E8 91B5M

Motor Sergeant: E7, 63B40

Signal Spt Sys Supv: E6, 31U30

Medial Supply Sgt: E6, 76J30

Preventive Med NCO: E6, 91S30

Supply Sgt: E6,, 92Y30

Sr Sig Spt Sys Maint: E5, 31U20

NBC NCO: E5, 54B20

Lt Wh Veh Mechanic: E5, 63B20

Equip Rec/Parts sp: E5, 92A20

Signal Spt Sys Maint: E4, 31U10

Forward Signal Spt SP: E4, 31U10

PWR-Gen Equip Rep: E4, 52D10

Lt Wh Veh Mechanic: E4, 63B10

Armorer: E4, 92Y10

Armorer/Supply Sp: E4, 92Y10

Signal Spt Sys Maint: E3, 31U10

Lt Wh Veh Mechanic: E3, 63B10

Equip Rec/Parts sp: E3, 92A10

Truck Utility: Cargo/Troop carrier 1-1/4 4 x 4 W/E (HMMWV) (3)

Truck Cargo: 4 X 4 LMTV W/E: (2)

Trailer Cargo: High Mobillity 3/4 ton: (2)

Truck Cargo: 4X4 LMTV W/E W/W: (1)

Trailer Cargo: LMTV w/dropsides: (1)

Trailer Tank: Water 400 gallon 1-1/2 ton 2 wheel W/E: (1)

Rmss Section (-) (4 Personnel)

Medical Supply SGT: E5, 76J20

Medical Equip Rep: E5, 35G20

Sterile Pharmacy NCO: E5, 91Q20

Medical Equip Rep: E4, 35G10

Trailer Cargo: LMTV w/dropsides (RMSS)

Truck Cargo: 4X4 LMTV W/E (RMSS)

Truck Lift Fork: DSL DRVN 4000 Lb Cap Rought Terrain

Treatment Platoon Headquarters (5 Personnel)

Platoon Leader: MAJ, MC

Sr Physician Assistant: MAJ, SP

Medical Operations Officer: 1LT, MS

Platoon Sergeant: E7, 91B40

Patient Admin SP: E4, 71G10

Truck Utility: Heavy variant HMMWV 4X4 GVW W/E: (4)

Truck Utility: Cargo/troop carrier 1-1/4 4X4 W/E (HMMWV): 1

Truck Cargo: 4X4 LMTV W/E: 1

Trailer Cargo: 3/4 ton 2 wheel W/E: 4

Trailer Cargo: High Mobility 3/4 ton: 1

NOTE: The Treatment Platoon HQ TOE provides 6 trucks for 5 people, to include 3 officers. These trucks need to stay with the main, but will need driver support from elsewhere in the Troop.

Treatment Squad Area Support (16 Personnel)

Field Surgeon: MAJ: MC, 62B

Field Surgeon: CPT: MC: 62B

Sr Physician Assistant: MAJ: SP

Physician Assistant: CPT: SP

Emergency Trmt NCO: E6 (2)

Emergency Trmt NCO: E5 (4)

Emergency Trmt NCO: E4: (2)

Emergency Trmt NCO: E3: (4)

Medical Equipment Sick Call field (2)

Medical Equipment Trauma field (2)

Table Operating Room field (2)

Sink unit surgical scrub and utensil hosp field: (20)

Truck Utility: Cargo/Troop Carrier 1-1/4 4X4 W/E (HMMWV) (4)

Trailer Cargo: High Mobility 3/4 ton: (4)

Area Support Squad (4 Personnel)

General Dental Officer: CPT, 63A00

Dental Specialist: E4, 91E10

X-ray specialist: E4, 91P10

Medical Lab sp: E4, 92B10

Truck: cargo: 4X4 LMTV W/E

Surgical Squad (2) 9 Total Personnel Per Squad

General Surgeon: MAJ, 61J (2)
Nurse Anesthetist: CPT, 66F (2)
Medical -Surgical Nurse: CPT, (1)
Practical Nurse: E6, 91C30 (2)
Operating room NCO: E5, 91D20: (1)
Operating room spc: E4, 91D10: (1)
Medical Equipment set surgical squad field lightweight: (1)
Anes App Gas: W/O2 Monitor N2O O2 & Volatile Liq 4 cy cap port
Truck Cargo: 4X4 LMTV W/E (1) (2 trucks in Main, 1 per squad)

Patient Holding Squad (4 Total Personnel)

Wardmaster: E6, 91C30 (1)
Practical Nurse: E5, 91C20 (1)
Medical Specialist: E4, 91B10 (1)
Medical Specialist: E3 91B10 (1)
Medical Equipment set Patient Holding Squad field lightweight: (2)
Light Set General Illumination: 25 outlet (Army) (1)
Truck Cargo: 4X4 LMTV W/E

NOTE: This section needs to set up two different 20 bed wards, but have no tentage currently authorized and have only one truck and one light set. Tentage, lights sets, and generator support with transporation are a critical shortage for this section in the current TOE.

Ambulance Platoon

Ambulance platoon HQ (1 personnel)
Platoon Sergeant: E7 91B40
Truck Utility: Cargo/Troop Carrier 1-1/4 ton 4X4 W/E (HMMWV)

Ambulance Squad (4) (4 Per Squad, 16 Total Personnel)

Aide/Evac NCO: E5, 91B20 (4)
Ambulance Aide/Driver: E4, 91B10 (8)
Ambulance Aide/Driver: E3, 91B10 (4)
Truck Ambulance: 4 Litter Armd 4X4 W/E (HMMWV)

NOTE: The TOE personnel recap does not equal the number of officers listed seperately. Counted seperately, there are 26 officers listed in the body of the TOE. The recap total says 24, but the number listed by rank and branch equals 25. The missing officer is a PA: there are five listed in the TOE, but only four on the recap.

Modules

The following RSA Main modules can be deployed to a company team element as required:

1. Sugical Squad Module: One Surgical Squad could be sent out to reenforce a logistics team as an expert trauma unit. This would add two Surgeons, the best trained Doctors for trauma. They might save some lives that would be otherwise lost, particularly when without aerovac support.
2. Radiolgy module: X-ray unit and technician: as above could go where a large number of patients were expected
3. Blood storage units: Essentially, a refridgerator with 15-30 units of blood +/- technician (medic).
4. Lab module: Lab technician and his equipment.
5. Holding module: Wardmaster, one other attendant, 20 cots and tentage.

BIBLIOGRAPHY

Books

- Pagonis, LTG William G. Moving Mountains. Boston, MA: Harvard Business School Press, 1992.
- Thompson, MG Julian T. The Lifeblood of War. Oxford, UK: Brassey's, 1991.

Periodicals

- Boatman, John. "The Future of Armoured Recce." International Defense Review 25 (October 1992): 965 - 973.
- Delamain, Charles. "How Long is a Piece of String?" Military Technology XVI7 (July 1992): 55-61.
- Etchenchury, LTC James. "The Armored Gun System Debate: Let it Begin Before it is Too Late." Armor Magazine C1 (January-February 1991): 32-34.
- Moilanen, LTC Jon H. "The Light Cavalry Regiment in Contingency Operations." Military Review LXXII 10. (October 1992): 65-75.
- Nagl, CPT John A. "The Armored Gun System: Sheridan Replacement Offers Better Firepower Plus Worldwide Mobility." Armor Magazine C14 (July-August 1992): 26-29.
- Power, LTC Nothan J. "Force Projection Logistics." Military Review LXXIII (July 1993): 45-49.
- Whelden, LTC Craig B. "Light Cavalry: Strategic Force for the Future." Military Review LXXIII 4 (April 1993): 13-20.

Tables of Equipment and Related Publications

- U.S. Army, "TOE NO. 63456LO Headquarters and Headquarters Troop, Support Squadron, Armored Cavalry Regiment". Washington: Department of the Army 1 Oct (no year).
- U.S. Army, "TOE NO. 17460L000 Armored Cavalry Regiment (2ACR)". Washington: Department of the Army 28 Oct (no year).
- U.S. Department of the Army, "Executive Summary, TOE 17460L000 2nd Armored Cavalry Regiment (Army of Excellence)". Fort Knox: Department of the Army, not dated.

U.S. Department of the Army, "Operational and Organizational Plan, TOE 17460L000 2nd Armored Cavalry Regiment (Army of Excellence)". Fort Knox: Department of the Army, not dated.

Manuals

- FIELD MANUAL 8-10 Health Service Support in a Theatre of Operations, Washington, D.C.: HQ Department of the Army, 1 March 1991.
- FIELD MANUAL 17-95 Cavalry Operations, Washington, DC: HQ Department of the Army, 1991.
- FIELD MANUAL 54-30 Corps Support Groups, Washington, DC: HQ Department of the Army, June 1993.
- FIELD MANUAL 63-1 Supporting the Separate Brigades and the Armored Cavalry Regiment (Draft). Fort Lee, August 1993. (Electronic Media.)
- FIELD MANUAL 63-3 Corps Support Command (Draft), Washington, DC: HQ Department of the Army, March 1990.
- FIELD MANUAL 63-6 Combat Service Support in Low-Intensity Conflicts, Washington, DC: HQ Department of the Army, January 1992.
- FIELD MANUAL 71-3 Armored and Mechanized Infantry Brigade, Washington, DC: HQ Department of the Army,
- FIELD MANUAL 90-26 Airborne Operations, Washington, DC: HQ Department of the Army, December 1990.
- FIELD MANUAL 100-5 Operations, Washington, DC: HQ Department of the Army, 1986.
- FIELD MANUAL 100-5 Operations, Washington, DC: HQ Department of the Army, 1993.
- FIELD MANUAL 100-10 Combat Service Support, Washington, DC: HQ Department of the Army, 1988.
- FIELD MANUAL 100-15 Corps Operations, Washington, DC: HQ Department of the Army, 1989.
- FIELD MANUAL 100-16 Support Operations for Echelons above Corps (EAC) (Preliminary Draft), Washington, DC: HQ Department of the Army, not dated, marked 1992 by CARL.
- FIELD MANUAL 100-17 Mobilization, Deployment, Redeployment, Demobilization, Washington, DC: HQ Department of the Army, October 1992.
- FIELD MANUAL 100-27 US Army/US Air Force Doctrine for Joint Airborne and Tactical Airlift Operations, Washington, DC: HQ Department of the Army, January 1985.
- FIELD MANUAL 101-5 Staff Organization and Operations, Washington, DC: HQ Department of the Army, 1984.

FIELD MANUAL 101-10-1/2 Staff Officers Field Manual-Organizational, Technical, and Logistical Data, Planning Factors (Volumes 1&2), Washington, DC: HQ Department of the Army, 1987.

Memorandums, Documents, Electronic Media

CAC LACR Final Brief to Army Chief of Staff, 7 August 1992 (Electronic Media).

CAC LACR Brief to Branch Proponents, 20 August 1992 (Electronic Media).

Littel, MAJ Mark T. "The Light Armored Cavalry Regiment-- Reconnaissance Force of the Future" Advanced Military Studies Monograph, U.S. Army Command and General Staff College, December 1992.

Martin, MAJ Bryan L. "Medical Coverage of the Regiment in Pursuit. (Draft)" Unpublished, not dated.

Martin, MAJ Bryan L. "Experience of a Far Forward Medical Unit in Operations Desert Shield and Storm. (Draft)" Unpublished, not dated.

Memorandum from MAJ Kevin Benson, XVIII G-3 Plans officer, to MAJ John Friedson, subject: "XVIII Airborne Corps Utilization of 2ACR," dated 18 November 1993.

Support Squadron, 3ACR Original Briefing Materials, ODS/S.

Support Squadron, 3d Armored Cavalry Regiment, ODS/S Lessons Learned. (Electronic Media.)